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LEUKAEMIC INFILTRATIONS*

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(*With Special Plate*)

What is the nature of these infiltrations? Three possible explanations may be given. The cells may accumulate in certain situations through being drawn out of the blood stream as they pass along the capillaries; some physical feature may detain them in their passage; or something in the nature of chemiotaxis may attract them; such arrested cells may multiply locally, the original arrested cells being few. Secondly, the accumulation of cells may be a response of local cells to some stimulus. Thirdly, the accumulation may represent the arrest of emboli of a true tumour process. In the cases under consideration extensive infiltration of the heart muscle or between the tubules of the kidneys cannot be explained by multiplication of local cells.

Another way in which the infiltrations differ from ordinary secondary malignant deposits is that the infiltration by cells is of a diffuse nature, the muscle bundles or renal tubules remaining for a long time distinct, though widely separated by masses of cells. This diffuse distribution is still maintained in parts where the deposit is of a circumscribed and nodular type. In the case of malignant deposits, although infiltration does occur slightly around the periphery, the original structure is entirely destroyed in the main portion of the deposit. The view, therefore, seems justifiable that the infiltrating cells reach their situation by the blood stream and then may undergo multiplication. But the method of infiltration is more diffuse than that of ordinary malignant deposits.

Causes of Death

The majority of leukaemic patients die as the result of a secondary anaemia and gradual asthenia, or from intercurrent infections. Among the rarer accidents that may lead to death leukaemic infiltration of the heart muscle must be considered, since this seems clearly to have been the cause of death of the male dement to be mentioned.

The intense leukaemic infiltration seen sometimes in the kidneys may obviously be in some cases so extensive as to interfere with renal function and lead to a form of uraemia of the anuric type. In these cases, however, the general disease is probably so far advanced that uraemic manifestations, if present, might be obscured in the dying patient. In some cases it seems possible that intense infiltration of the kidneys may occur with leukaemic lesions not far advanced elsewhere; under these circumstances death might result from uraemia.

Haemorrhages in the brain may be a cause of death; leukaemic infiltration does occur in this organ. In the effused blood white cells are present in large numbers, and this may suggest extensive infiltration. The Virchow-Robin space may contain many leukaemic cells.

In some leukaemic cases the capillaries in the alveoli of the lung may be stuffed with white cells, which, in sections, may be seen to have escaped in considerable numbers into the alveoli themselves. In such cases they probably appear eventually in the sputum.

Differentiation

It is hard to draw a sharp line of distinction between lymphatic leukaemia and lymphosarcomatosis, since there are cases showing infiltrations, sometimes extensive, which may be aleukaemic at the beginning and afterwards show a leukaemic change in the blood; these would seem to be connecting cases. Similarly, it is hard sometimes to decide whether a case is lymphosarcomatosis or an aberrant member of Hodgkin's group. As we have seen, Turnbull considers both these conditions to be granulomatous. In what are considered to be cases of lymphosarcomatosis, multinucleated cells may be seen occasionally. In some cases grouped under Hodgkin's disease we may see a general uniformity of cell type, although the cell is larger and paler than the large lymphocyte of lymphosarcomatosis.

Turnbull[3] lays stress on enlargement of the spleen being essential for the diagnosis of leukaemia. In some of our examples of infiltration in what we have considered to be aleukaemic cases of leukaemia the spleen has not been enlarged, and in some of the definite cases with leukaemic blood the enlargement has only been trivial. It does not seem that enlargement of the spleen is a necessary condition for the post-mortem diagnosis of leukaemia.

In October, 1931, a male dement aged 57, who had been in the Parkside Mental Hospital for thirty-two years, and apparently had been a healthy man throughout his stay, collapsed and died within a few minutes, with signs of acute heart failure. The post-mortem examination revealed four pints of clear fluid in the pericardial cavity, and replacement of the heart muscle to a considerable extent by a glistening and slightly translucent whitish tissue, which projected slightly on the front of the right ventricle and on the posterior aspect of the left ventricle. The heart was hypertrophied, weighing 20 oz. The liver weighed 91½ oz., and the spleen 12 oz. Both the kidneys were large, and had one or two indefinite pale patches in the cortex. The mediastinal glands were normal. Microscopical examination showed infiltration of the heart muscle by rounded or somewhat oval

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cells (Fig. 1 on the Plate), and a similar infiltration between the tubules of the kidneys (Fig. 2), but no obvious infiltration in the liver. In the brain there was a definite slight increase of lymphocytes in places. Death was clearly attributable to heart failure from infiltration of the heart muscle by these cells.

Two years later another patient in the mental hospital, a man aged 42, suffering from dementia praecox, was transferred to the infirmary ward for special care and treatment on account of influenza. His temperature continued to oscillate, he became very anaemic, and died on December 9th. At the necropsy it was found that the heart muscle was rather pale but firm. The liver weighed 59¼ oz. and the spleen 4½ oz. The kidneys were not enlarged, but the medulla of both was pale. Microscopical examination of a papillary muscle and of a portion of the septum of the heart showed some irregular diffuse infiltration with rounded cells, among which were definite myelocytes. In some foci the cells seemed to be breaking down and the nuclei disintegrating. In the liver there was some infiltration with myelocytes and polymorphonuclears, but there was no infiltration in the kidneys or testes. The marrow of the shaft of the femur, which appeared greyish white, showed numerous myeloblasts and nucleated red cells. Death was attributable to the profound anaemia, with dilatation of the heart and early hypostatic pneumonia.

In January, 1929, a schoolboy, aged between 12 and 14, was treated at home for an illness of a vague nature with a raised temperature. He was then sent to a private hospital, where after a stay of two or three days he developed what seemed to be a fit, and died before his medical attendant could see him. There was a history of his having been hit on the head by a cricket bat or ball; the blow apparently had not been a severe one. At the post-mortem examination scattered softened foci with haemorrhages were found in the brain. He had a large liver and a fairly large spleen, with an enlargement in the neighbourhood of the thymus, but the lymph glands were not noticed to be enlarged. Sections of the brain showed extensive areas packed with cells of a myeloblastic or myelocytic type (Figs. 3 and 4). The areas looked like haemorrhages in which white cells were taking the place of red cells. There was also an infiltration of a diffuse nature in the kidneys (Fig. 5) and in the liver.

About twelve years ago a child aged 18 months died at the Children's Hospital with, among other symptoms, a sloughing ulceration of the pharynx. Post-mortem examination showed that the kidneys were very extensively infiltrated with myelocyte-like cells with indented nuclei—to such an extent that tubules were only to be seen at wide intervals, and the glomeruli appeared isolated in the mass of cells (Fig. 6). There was a very extensive infiltration of the pancreas (Fig. 7), and an infiltration (apparently by myelocytes) with many mitoses in the region of the thymus. Groups of Charcot-Leyden crystals were frequent in the infiltrations. The case was evidently an acute form of leukaemia, a condition which had been suspected before death, though a blood count had not been made.

In the first three of these cases no suspicion of their possible leukaemic nature existed before death. One patient died in a few minutes; the others were ill for from ten days to two months. No blood count estimations were made. Nevertheless, the extensive nature of the infiltrations suggests that an overflow into the blood stream had very likely taken place, and that a leukaemic picture would have been presented therein. Problems that present themselves for investigation are:

1. Do these and similar types of infiltration, sometimes diffuse and sometimes nodular, in the heart or kidneys or liver or subcutaneous or other tissues, represent one process or several different entities, some leukaemic and some not leukaemic?

2. Is there a clear-cut means of distinguishing between leukaemic infiltrations, lymphosarcomatous infiltrations, and the infiltrations met with in some cases of acute Hodgkin's disease?

Definitions

Diffuse infiltrations by the appropriate cells of the liver, kidneys, and other organs and tissues are common features of ordinary cases of myeloid and lymphatic leukaemia. In true pseudoleukaemia (systemic aleukaemic lymphomatosis) the picture is that of lymphatic leukaemia, with numerous groups of enlarged lymph glands, and, possibly, deposits in such organs as the spleen, liver, kidneys, and gastro-intestinal lymphatic system, but without the leukaemic blood picture. In Sternberg's leucosarcomatosis a lymphatic leukaemic blood picture is associated with more atypical characters in the cells which form tumour-like infiltrations. The appearances suggest a neoplastic process, but there seem to be all varieties of transitions to ordinary cases of lymphatic leukaemia. In chloroma, lymphomatous masses are found particularly in the skull, with groups of enlarged lymph glands and enlargement of the spleen, and with, or even without, a leukaemic blood picture.

H. M. Turnbull[3] depicts "lymphosarcoma" as follows: a condition in which cells resembling large or small lymphocytes or lymphoblasts lie in the meshes of a fibrillar reticulum, replacing the normal tissues like an infiltrating neoplasm; a single group of lymph glands or several areas of adenoid tissue may be affected; several foci may be affected simultaneously, as in lymphoid tissue in the intestine; the periadenoid tissues become infiltrated; and secondary foci may appear in organs where adenoid tissue is normally present, as in the spleen, bone marrow, and portal system of the liver, or even in those in which it is not normally present, as in the skin, kidney, and myocardium. The spleen, he states, is the key organ in differentiating "lymphosarcoma" from lymphatic leukaemia. If the spleen is unaffected leukaemia is excluded. If it is affected the lesion is confined to the Malpighian bodies in lymphosarcoma, while in lymphatic leukaemia it affects the pulp primarily. He considers lymphosarcoma a lymphogranuloma rather than a neoplasm, and closely allied to Hodgkin's disease.

Ordinary cases of Hodgkin's disease present a characteristic histological picture, with large and small lymphocytes, eosinophil cells, often plasma cells, proliferating reticulum cells, and usually reticulum giant cells, followed by fibrosis. In Hodgkin's sarcoma as described by Ewing[1] the picture varies from a close resemblance to the ordinary form to a tissue composed of large round cells with faintly staining granular cytoplasm and moderately chromatic vesicular nuclei; large round giant cells with multiple or multilobed nuclei may predominate. Pullinger[2] considers these various cells in this disease as probably all derived from the reticulum cells, constituting, in fact, a reticulosis.

Clinical Considerations

In the course of 3,142 post-mortem examinations at the Adelaide Hospital, and 358 at the Parkside Mental Hospital—a total of 3,500 cases—the incidence of leukaemia, lymphosarcoma, and Hodgkin's disease was as follows: ordinary myeloid leukaemia, nine; myeloblastic leukaemia, four; ordinary lymphatic leukaemia, seven; lymphatic leukaemia with extensive infiltrations, three; pseudoleukaemia (aleukaemic leukaemia), three; leukaemic infiltrations found but blood counts not made, four; atypical cases, perhaps leukaemias, three; lymphosarcomata, six; multiple myelomata, two; chloroma (?) (no increase of white cells in the blood), one; ordinary Hodgkin's disease, seven; acute Hodgkin's disease with multinucleated cells, six; and Hodgkin's disease with sarcoma (reticulo-endothelioma), three. In the 358 mental patients only two cases occurred; they are grouped as

"leukaemic infiltrations found but blood counts not made," being the two examples given of infiltration of the heart muscle. The schoolboy with the cerebral haemorrhage and unsuspected leukaemic infiltration, and the infant of 18 months from the Children's Hospital, are not included in the above. An epitome of those cases in the above series showing unusual degrees of infiltration will indicate the scope of these, and the difficulty often experienced in deciding on the correct diagnosis.

Infiltrations in Known Leukaemic Cases

Myeloid Leukaemia: Nodules in the Peritoneal Cavity, Ovaries, and Liver, with Ascites.—No. 99/31: A woman aged 40 had received deep *x*-ray treatment for myeloid leukaemia. The white cell count during her last period of admission was reduced to 18,600 per c.mm., with 69 per cent. myelocytes. The spleen weighed 86 oz. and the liver 102 oz. There were nodules over the peritoneal cavity tending to fuse, from a pin's head to a walnut in size, with ascites. Myelocytes infiltrated the liver and kidneys, and composed the nodules; mitoses were present.

Lymphatic Leukaemia with Infiltration at the Sites of Soamin Injections and a Surgical Incision.—No. 143/20: A man aged 66 had a sore on the back of the right hand, which was followed by a painless lump near the elbow. Six months later he was admitted with enlargement of the glands at the right elbow, in the right axilla, on both sides of the neck, and in the inguinal regions. No increase in his white cells had been detected six weeks before admission. When admitted they numbered 422,000, consisting almost entirely of large lymphocytes. The spleen weighed 36 oz. and the liver 50 oz. Where soamin injections had been made in the left arm the subcutaneous tissues were infiltrated. There was a similar infiltration over the site where a supratrochlear gland had been removed. There was infiltration of the skin over the right biceps. Besides the glands mentioned, those along the vertebral column and common iliac arteries and the femoral glands were enlarged.

Lymphatic Leukaemia with Tumour-like Infiltrations (Leucosarcoma), Nodules in the Kidneys, Liver, and Pericardium, Plaques on the Ribs and in the Spinal Canal. Low Leucocyte Count.—No. 10/23: A man aged 38 had a white blood count of 11,000, of which the lymphocytes contributed 80 per cent. There was an infiltrated neoplastic-looking mass on the posterior aspect of the bladder in the depths of the recto-vesical pouch, and extending to the prostate. The kidneys were studded with nodules with rather ill-defined outlines; there was a diffuse infiltration, with the remains of tubules still showing in many places. A few ill-defined nodules were present in the liver and also in the pericardium. There were diffuse whitish elevations on some of the ribs and in the spinal canal. A plaque in the pia mater pressed on the subjacent cord near the commencement of the cauda equina; microscopical examination of this mass was not made owing to the accidental loss of the specimen.

Lymphatic Leukaemia with Tumour-like Masses (Leucosarcoma) around the Abdominal Aorta, in and around both Kidneys, in the Mediastinum, and in the Left Scrotal Sac.—No. 82/26: A man aged 51 had a white cell count of 48,000, of which the lymphocytes contributed 89 per cent. The spleen, which was said to have been enlarged for eleven years, weighed 92 oz., and the liver 82¼ oz. The tissues in front of the abdominal aorta showed a diffuse firm pinkish-white infiltration surrounding this vessel and the inferior vena cava; they extended laterally to form cuirasses around each kidney, as well as infiltrating each kidney by way of the hilum and pelvis. The suprarenal glands were lost in the mass of infiltration, and the pancreas was surrounded. The left scrotal sac was infiltrated. There was an infiltrating mass partly embracing the lower portion of the trachea, and another behind the heart. The glands in the axillae and groins were also enlarged. Microscopically there was infiltration in the liver—of Glisson's capsule more particularly—and in the kidneys a diffuse infiltration affecting also the surrounding fat.

Infiltrations in Pseudoleukaemia

In the examples above detailed the leukaemic nature of the cases is beyond question. In the two following cases, placed under "pseudoleukaemia," the leucocyte count was either reduced or not greatly increased, and the differential counts were normal. Otherwise the pathological pictures were those of a leukaemia, and the cell infiltrations were similar in characters to those met with in leukaemic cases. As it is well known that cases, later showing typical leukaemic blood pictures, may be met with in an aleukaemic (presumably early) stage with enlarged glands, there is no reason to consider these cases as being aetiologically distinct from leukaemia.

Pseudoleukaemia with Infiltration in the Liver.—No. 205/30: A girl aged 13½ had a profound secondary anaemia and a white cell count of 3,700; a differential count revealed no abnormal cells, but the polymorphonuclears were reduced. The spleen weighed 14 oz. and the liver 81 oz. There was slight enlargement of the external lymph glands and the mesenteric glands. The liver was stuffed with enormous numbers of round cells in patches, obscuring Glisson's capsule; there were also small groups between the liver cells suggestive of blood-forming islands. In the spleen the medulla was full of red cells, contrasting with the lymphoid areas. In the kidneys, cells with indented nuclei accompanied the blood vessels in the medullary and glomerular regions.

Pseudoleukaemia, with Extensive Infiltrations in the Liver, Kidneys, and Testis, and Infiltration of the Heart Muscle.—No. 123/34: A boy aged 13 had a white cell count varying from 6,000 to 14,000, the cells being present in normal proportions. The spleen weighed 27 oz., and the liver was large. There were very large glands around the pancreas, along the abdominal aorta and iliac vessels, and in the groin. The mesenteric glands were enlarged, as were the tracheal glands. There was an extensive infiltration of the liver with large mononuclear cells. In the kidneys the renal tubules in places were only seen at wide intervals on account of the infiltration. There was some diffuse infiltration in the heart muscle, and extensive infiltration of the testis. Lymphocytes were present also in the pial vessels, and accompanying the small vessels in the pons, cerebellum, medulla, cortex, and basal nuclei. These cells were like large lymphocytes, with rounded nuclei occupying most of the cell.

Infiltrations Believed to be Leukaemic

Under this heading, comprising cases in which no blood count was taken, come the four mentioned at the beginning of this paper, and the case which follows.

No. 121/32.—A lad aged 18 died thirty-two hours after admission. The spleen weighed 40¾ oz. and the liver 110 oz. The lymph glands were generally enlarged. There was enlarged tissue in the mediastinum, and the kidneys were infiltrated.

This last-mentioned case, with much enlarged liver, spleen, and lymph glands, seems unquestionably one of leukaemia. The boy who died with softened areas and haemorrhages in the brain had obviously leukaemic blood, as indicated by the white cell accumulations in the effused blood. The child of 18 months seems also an undoubted case. The first dement had a very large liver, but only a slightly enlarged spleen and no enlarged lymph glands. Nevertheless the cell infiltration of his heart muscle had caused his sudden death, and the accumulation of cells in his kidneys was considerable. In the second dement the only important features linking it with a possible leukaemic process were the infiltration of the cardiac muscle by myelocytes and the presence of similar cells between the liver columns, the spleen and lymphatic glands being not appreciably enlarged. Blood counts in these dements might have settled their leukaemic nature beyond dispute. Even had such an examination shown a normal blood

picture this would not exclude leukaemia, perhaps in an early stage. Both men died from what might be called "leukaemic accidents" (if they are leukaemic cases); the complete pathological picture might be considered as not having yet become developed.

Possible Chloroma

No. 99/34.—A woman aged 52 had a white count varying from 4,100 to 8,000 per c.mm. The differential count was mostly normal, though metamyelocytes varying from 2 to 12 per cent. were noted on two occasions, and several abnormal cells were seen on two occasions. A fleshy mass attached to one of the costal cartilages was continuous with a similar mass in the anterior mediastinum. An extradural sheet of tissue pressed upon the dorsal cord. The abdominal glands were slightly enlarged. The spleen weighed about 30 oz. and the liver 64 oz. The infiltrating cells resembled large lymphocytes.

Lymphosarcoma with Infiltrations

Four examples from the six cases which were diagnosed as lymphosarcoma in these necropsies are epitomized. The differentiation of these from cases considered to represent leukaemic infiltrations, but without leukaemic blood changes, is difficult if not impossible. The details show that the distribution of the infiltrations follows similar lines to those in the leukaemias. In typical lymphosarcoma a delicate reticulum passes between the cells, but it may not be readily demonstrable.

No. 36/26.—A man aged 40 had extensive infiltration of the ilio-psoas muscle, of the recto-vesical space, between the stomach and liver, in and around both kidneys, in the pericardium, and in the mediastinum. He had haemorrhage from a secondary malignant ulcer of the stomach. The spleen was not weighed.

No. 173/27.—A woman aged 40 had infiltration of the head of the pancreas, the base of the mesentery, along the abdominal aorta, and into both ischia, with resulting caries and secondary gangrene of the labium majus. The spleen weighed 12 oz. and the liver 56 oz.

No. 119/34.—A young woman aged 21, in whose case no blood count had been done, showed infiltration of the mediastinum, pericardium, and pleura; there were enlarged glands in the abdomen and base of the neck, and deposits in the kidneys (Fig. 8 on Plate). The spleen weighed 8¾ oz. and the liver 51 oz. There were mitoses in the coeliac glands.

No. 46/35.—A young woman aged 22 had a mediastinal mass surrounding the great vessels, infiltrating the heart muscle, and invading the right pleura over the diaphragm, with nodular masses and hydrothorax. The glands in the coeliac axis and in the portal fissure were enlarged. The spleen weighed 3 oz. and the liver 56 oz. The infiltrating cells resembled lymphocytes, with nuclei 3.5 to 5 μ in diameter.

Acute Hodgkin's Disease with Multinucleated Cells and Infiltrations

No. 170/29.—A woman aged 64 had deposits in the peritoneum, enlarged glands along the abdominal aorta, deposits in the liver up to one inch in diameter with necrosed centres, and deposits in the right kidney. There were enlarged glands in the neck, around the thoracic aorta, and in the roots of the lungs, with infiltrations of the lungs. The spleen weighed 6½ oz. and the liver 65¼ oz. The cells appeared to be reticulum cells, and the multinucleated cells were unusually large and numerous.

No. 162/34.—A lad aged 18 had a white cell count of 12,500 per c.mm., with 5 per cent. of eosinophils. Masses in the mediastinum and interior portion of the pericardium extended into the right lung, with right pleural effusion and with nodular infiltration of the left lung. There were deposits in both kidneys (Fig. 9 on Plate), suprarenals, and the pancreas, with a large mass round the abdominal aorta. The spleen weighed 4½ oz. and the liver 53¾ oz. Microscopically there was fibrosis, necrosis, eosinophil infiltration, and proliferating reticulum cells, many with compound nuclei.

No. 77/35.—A man aged 26 had been treated for seven years with deep x rays for Hodgkin's disease. There were enlarged glands in the mediastinum, the neck, around the pancreas, along the abdominal aorta into the left groin, and in the axillae. The bronchial glands were enlarged on the right side, and there was invasion of that lung with miliary spread. There were umbilicated deposits in the liver and spleen up to the size of 3¼ inches and 2 inches respectively. A sheet of tissue pressed on the cauda equina.

No. 109/35.—A man aged 21 had a leucocyte count falling from 6,000 to 1,600 per c.mm.; the differential count showed a polymorphonuclear leucopenia. There were large soft glands around the pancreas, along the abdominal aorta extending into the left groin, and one soft gland in the right side of the neck. The spleen was much enlarged and weighed 40 oz., but did not show white nodules; the liver weighed 62¼ oz. There were ulcers in the stomach and duodenum.

Hodgkin's Disease: Sarcomatous Type

No. 111/32.—A man, aged 50, on whom no blood count had been done, had enlarged soft pinkish glands in the mediastinum and along the abdominal aorta, in the neck, axillae, groins, and the mesentery, with infiltration of the pericardium and wall of the heart. The infiltrating cells suggested reticulum cells.

Summary

1. Examples are given of: (*a*) leukaemic infiltration of heart muscle, in one case causing sudden death in a hitherto seemingly healthy man; (*b*) leukaemic infiltration of the kidneys or pancreas to a degree calculated to embarrass the functions of such organs; (*c*) leukaemic cerebral accidents in which white cells form conspicuous accumulations, mostly from the associated haemorrhage; and (*d*) neoplastic-like deposits of seemingly leukaemic cells in various organs and tissues in known or presumed leukaemic cases, and in cases which have not shown any alteration in the blood picture (pseudoleukaemia).

2. Examples are given of infiltrations in lymphosarcomatosis. The author finds it difficult to decide in some cases whether the condition is a lymphosarcoma or a pseudoleukaemia. He is not satisfied that there is a sharp line of demarcation between these.

3. Examples are also given of infiltrations in acute cases of Hodgkin's disease and Hodgkin's sarcoma of Ewing. The presence, even in small numbers, of reticulum cells with compound or multiple nuclei is a help in diagnosis, and enables some cases resembling lymphosarcoma to be reasonably transferred to this group.

REFERENCES

[1] Ewing, James: *Neoplastic Diseases*, 1928.
[2] Pullinger, B. D.: *Rose Research on Lymphadenoma*, 1932, p. 117.
[3] Turnbull, H. M.: *Proc. Roy. Soc. Med.*, 1929, xxiii, 220.

L. v. Szathmáry (*Zentralbl. f. Gynäk.*, October 19th, 1935, p. 2477) describes an extreme case of uterine hypertrophy induced by hormone production in granulosa-cell ovarian tumours. The patient, 63 years old, had had procidentia since two years before the menopause (at 43), and an ulcerated os externum was noted on a bluish-red tumour, larger than a child's head, which protruded from the vulva. After rest it proved to be replaceable, and was found to be connected with a pelvic swelling reaching to three fingerbreadths below the navel. There was a copious cervical discharge of pus, and a diagnosis of myoma and pyometra was made. The uterus on removal was twice the size of the fist; it was free from myoma or other tumour, but there was cervical hypertrophy. The myometrium was 6 cm. thick. The remains of the endometrium showed glandular hyperplasia and penetration of the myometrium, in the stroma of which were numerous cells resembling those of the decidua. A yellow granulosa-cell cyst was found in one ovary, and the urine after operation contained 360 mouse units of folliculin to the litre.

STAPHYLOCOCCAL INFECTIONS OF THE SKIN AND THEIR TREATMENT*

BY

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(With Special Plate)

Of the conditions which come under the care of the dermatologist, the following have been shown to be due to infection by staphylococci: sycosis coccogenia ; sycosis nuchae ; recurrent furunculosis ; carbuncle ; blepharitis ; acne necrotica ; hydradenitis (axillary abscess) ; pyogenic granuloma ; acrodermatitis continua ; porofolliculitis (Bockhart's impetigo) ; dermatitis infectiosa eczematoides; onychia and paronychia ; multiple subcutaneous abscesses of infants ; pemphigus neonatorum, and miliaria rubra (prickly heat). The type of lesion is determined by circumstances such as the age and state of health of the patient, the site of the initial infection, the condition of the skin at the time of infection, and the subsequent treatment. For example, porofolliculitis, which is an eruption of multiple follicular pustules, usually follows the application of some irritant, such as liniment, plaster, blue ointment, or foments, particularly to hairy parts.

These infections tend to remain pure, or textbook in type. The explanation may be that different strains of the organism are responsible for the differing types of infection. Cases of sycosis rarely develop boils or carbuncles. Few cases of recurrent furunculosis develop sycosis, though there must be daily contamination of the beard area with the infecting staphylococcus. A patient who has a pure staphylococcal infection of the nasal sinuses may develop blepharitis and sycosis of the upper lip, but he will not suffer from boils.

Predisposing Conditions

Most dermatologists will agree that the really troublesome and persistent infections occur in seborrhoeic patients.[1] Virulent staphylococci cannot be regarded as normal habitants of the human skin, but exposure to infection must be very frequent. Active lesions due to this organism are certainly a potent source of infection to other people, either by direct or by indirect contact. Nurses and doctors contract furunculosis from patients with this type of infection, and boils, porofolliculitis, and sycosis may originate in the barber's shop. When once the skin has been infected irritation of the hair follicles in which the organisms lurk predisposes to their active growth, and friction may determine the site of a boil or a carbuncle.

An unhygienic indoor life, overwork, anaemia, excessive or inadequate diet, chronic infections elsewhere, and occasionally hyperglycaemia are factors operative in certain cases. The most intractable of these infections, sycosis barbae, is never seen except in seborrhoeic persons. These patients usually have other seborrhoeic manifestations, such as pityriasis, seborrhoeic dermatitis, or acne, or these conditions have at one time been present. The most severe cases occur in those whose resistance to infection has been low since childhood—the subjects of chronic infectious eczematous dermatitis of the scalp, ears, and flexures, chronic blepharitis, rhinitis, and nasopharyngeal catarrh. Dolman has recently pointed out that many of these patients have a pure staphylococcal infection of the nasal sinuses. Sycosis of the moustache area is nearly always associated with nasal catarrh and blepharitis.

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Treatment

The treatment of many of these conditions is simple. It follows the usual lines of attention to the general health by proper exercise and diet, with the local application of mild superficial antiseptics, of which every doctor has his favourites. Prevention of the spread of virulent staphylococci is important. This may be secured, as in the case of a boil, by an elastoplast dressing, or by the application of pure ichthyol. If the infection does not respond to simple measures, the administration of concentrated vitamins, the injection of heavy metals such as tin or manganese, autohaemotherapy, polyvalent bacteriophage therapy, Besredka antivirus, *x*-rays and ultra-violet light, and injections of various proprietary remedies have been tried, and have had their vogue. Vaccines, both autogenous and stock, have been used. The very multiplicity of remedies suggests that none can be relied upon to promote recovery in the obstinate cases.

The Infecting Agent

The most important factor in many of these conditions is the strain of the infecting staphylococcus. Burnet[2] has shown that a highly virulent toxigenic *Staphylococcus aureus* strain may have *albus* variants. The power of the organism to form pigment is no guide to the virulence. During the past four years organisms have been cultured from various lesions and the strains of staphylococcus cultured have been investigated. The variation in toxin production of different strains of staphylococci has stimulated work on skin infections by this organism.

The observation that the blood serum in man and in animals often contains measurable amounts of antitoxin has suggested a new method of treatment.[3] We know that some strains of staphylococci may produce more than one toxin, and that each of the toxins (alpha and beta) can evoke a separate antitoxin. The differentiation between these toxins is achieved by their different haemolytic action on the red cells of the rabbit and sheep. The alpha toxin, which probably plays the major part in human infection, has several properties. It is haemolytic, induces dermonecrosis, and is lethal to animals. It has the power of destroying white blood cells, and so contains a leucocidin.

Panton and Valentine[4] state that toxin produced by staphylococci isolated from sycosis barbae proved to be weak in leucocidin and strong in haemolysin ; while cultures from patients suffering from pyaemia produced a toxin which was weak in haemolysin and strong in leucocidin. Research work is proceeding in several centres into the exact components of the exotoxin of the staphylococcus—work that will yield more exact knowledge of the antigen which recent investigations have suggested as a means of treatment.

Dolman and Kitching working in Toronto, and Morgan working in Melbourne, have shown that strains of alpha toxin vary considerably. To quote Dolman and Kitching[5]: "It should be emphasized that staphylococcal filtrates are by no means solely comprised of alpha and beta components . . . alpha toxin is not a simple entity. Moreover, one of us has demonstrated, by using the erythrocytes of various laboratory animals, the existence of a multiplicity of haemolysins in staphylococcus filtrates. Quite apart from this complexity of the haemolysins, a leucocidin, a plasma coagulase, and an enterotoxin have each been described as separate entities detectable in certain staphylococcal filtrates. No thoroughly reliable methods of titrating these other potentially pathogenic properties have yet been described, nor have these properties been investigated from the point of view of their relative significance in human disease. But we are satisfied that no one strain of staphylococcus can be relied upon to supply the multiplicity of antigens which it seems

TABLE I.—*Cases of Sycosis Barbae and Sycosis Nuchae Treated by Injections of Staphylococcal Toxoid*

Case	Sex	Age	Diagnosis	Duration of Disease	Number of Injections	Result	Observation of A.H.T. during Treatment	Remarks
1	Male	56	S. B.	7 years	10	Cured	0.5–1.6	Chin and upper lip affected. Apparently cured; slight relapse after three months, which responded to further injections
2	,,	25	,,	2 ,,	28	,,	0.5–3.6	Whole beard area affected—superficial type
3	,,	34	,,	12 ,,	30	Much improved	1.9–4.6	Old case with *x*-ray atrophy of both cheeks and blepharitis
4	,,	23	,,	1 year	30	Cured	0.5–9.2	Whole beard area with recurrent pustules on forearms
5	,,	35	,,	3 years	15	,,	0.3–2.0	Old case with *x*-ray atrophy of both cheeks (concentrated toxoid used for treatment)
6	,,	25	,,	1½ years	10	,,	1.7–5.1	Sycosis with subcutaneous abscesses of face
7	,,	53	S. N.	5 months	9	,,	1.0–10.0	Marked focal and general reaction to first injection of crude toxoid
8	,,	28	,,	6 ,,	8	,,	1.1–6.0	
9	,,	22	,,	14 years	15	Much improved	1.9–4.0	Typical sycosis nuchae with much scarring
10	,,	39	S. B.	7 ,,	10	Cured	0.5–5.0	Mild case without marked inflammatory symptoms
11	,,	50	,,	7 months	10	Much improved	0.8	Sycosis confined to chin
12	,,	31	,,	10 years	5	,, ,,	0.5	Superficial type; had been epilated twice by *x* rays
13	,,	40	,,	1½ years	4	Improved	0.2	Infection of skin of eyebrows as well as beard area
14	,,	44	,,	1 year	20	Much improved	0.3–5.0	Limited to small area on chin
15	,,	17	,,	1½ years	10	,, ,,	0.4	Beard area and blepharitis
16	,,	21	,,	2 months	9	Cured	0.3	Apparently cured; small area on chin. Joined permanent Army
17	,,	40	S. N.	1 year	20	,,	Private case	History of boils and pustules on neck with scarring
18	,,	22	S. B.	4 years	36	Improved		Chin
19	,,	40	,,	3 ,,	14	,,		
20	,,	22	,,	2 ,,	13	,,		
21	,,	24	Abscess	3 ,,	40	,,		
22	,,	30	,,	1 year	14	Cured		
23	,,	20	,,	2 years	20	,,		

S.B., sycosis barbae. S.N., sycosis nuchae. A.H.T., antihaemolytic titre of patient's serum.

TABLE II.—*Cases of Staphylococcal Infection other than Sycosis Treated by Injections of Crude Toxoid*

Case	Sex	Age	Diagnosis	Duration of Disease	Number of Injections	Result	Observation of Blood Anti-haemolytic Titre	Comments
1	Male	56	Carbuncle and subcutaneous abscess	1 month	8	Cured and relapse	2-5 -1.2	Recurrent single subcutaneous abscess three months later
2	,,	19	Seborrhoeic dermatitis and pustules of face	9 months	27	Marked improvement	1.1–10.0	Pustulation improved with treatment, leaving seborrhoea of scalp
3	,,	35	Boils	12 ,,	6	Cured	2.0–10.0	
4	Female	21	,,	6 ,,	3	,,	0.2–0.5	Local antiseptics
5	Male	40	,,	5 years	10	,,	1.2–4.0	Recurrent infection inside nostrils and boils elsewhere
6	,,	35	,,	6 months	12	,,	1.0–8.0	
7	,,	25	,,	2 ,,	3	,,	,,	Local antiseptics
8	,,	45	,,	2 ,,	5	,,	,,	,, ,,
9	Female	17	Pustules on face	9 ,,	15	,,	,,	,, ,,
10	Male	15	Boils	6 ,,	4	,,	,,	,, ,,
11	,,	21	,,	2 years	4	,,	,,	,, ,,
12	,,	24	,,	1 month	4	,,	,,	,, ,,
13	,,	18	,,	3 months	4	,,	,,	,, ,,
14	,,	23	,,	5 ,,	4	,,	,,	,, ,,
15	,,	24	,,	1 month	4	,,	,,	,, ,,
16	,,	21	,,	2 months	6	Improved		Mixed infection—staphylococci and streptococci; boils on hand and neck
17	Female	46	,,	2 ,,	5	Cured		Numerous boils on neck
18	Male	31	Abscess on neck	15 years	4	Improved		Scars of old abscess of neck and cheek
19	Female	52	Boils	7 months	4	Cured		,, ,, ,, ,, ,,
20	Male	38	,,	4 years	30	Improved 80%		Mainly on face and scalp
21	,,	40	,,	2 ,,	9	Cured		
22	Female	32	,,	2 ,,	8	Cured and relapse		
23	,,	46	Boils and carbuncles	7 ,,	8	Improved; still under treatment		
24	Male	27	,,	1 year	12	Cured		

desirable to have present in toxins from which toxoids for use on human beings are to be prepared."

Toxoid

The exotoxin of the staphylococcus, which is lethal if injected in the crude state, may be robbed of its dangerous properties, but allowed to retain its useful immunizing antigenic properties, by incubation for several days after the addition of a small percentage of formalin. The product thus obtained is known as toxoid, and it has been used in the treatment of chronic staphylococcal infections. By a series of graded injections it is possible to increase the amount of circulating antitoxin in the blood of human beings and animals even to twenty times the original titre. This increase in antitoxin is accompanied by immunity to infection in animals, and by improvement in the clinical condition of humans in a fair percentage of cases.

Treatment by Toxoid Injections

I chose a series of patients suffering from sycosis barbae for treatment, since these patients had resisted all previous attempts at cure, and the majority gave a history of infection for several years.[5] In addition, I have treated cases of recurrent furunculosis, subcutaneous abscess, and dermatitis infectiosa eczematoides in a seborrhoeic. This last patient was the source of our most potent toxigenic staphylococcus. My practice with the earlier patients treated in 1932 was to use a polyvalent toxoid, to begin with small injections of 0.05 c.cm., and to increase the dose cautiously at weekly intervals. In estimating the dosage I was guided by the clinical condition of the patient and by the measure of circulating antitoxin in his blood. My experience came to agree with that of Dolman[6] and of Murray,[7] that the patient's condition and response afford sufficient guidance to the dosage and frequency of injections, for individual patients vary in their response to toxoid. The work in London has been carried out with toxoid prepared by Burroughs Wellcome from a single strain of staphylococcus ; whereas Dolman in Canada uses polyvalent toxoid. Murray contends that a graded series of six to eight injections is usually sufficient for the treatment, and that further injections do not increase the amount of circulating antitoxin. In my experience eight injections have sufficed to cure cases of recurrent furunculosis, but patients with sycosis barbae require a long course of treatment to effect a cure. I have given one patient as many as forty injections ; the total amount of toxoid injected was 12 c.cm. Dolman has had a similar experience with obstinate infections.[8]

In a small percentage of cases local, focal, and general reactions occur after the early injections of the series. It is wise, therefore, to use very small doses when beginning the series or when resuming injections after an intermission. Unpublished experimental work at the Walter and Eliza Hall Institute in Melbourne on our early toxoid demonstrated that when stored the toxoid deteriorated, so that it lost 40 per cent. of its antigenic power after six months' storage at ice-box temperature. At room temperature the deterioration was more rapid.

Results of Treatment

Of twenty-three cases of sycosis barbae treated with injections of toxoid twelve may be regarded as cured and the remainder much improved, so much so that they have ceased to attend the out-patient clinic (Table I). In Table II are given the results of treatment in chronic staphylococcal conditions other than sycosis barbae. Of twenty-four patients, eighteen were cured and the remainder much improved. Cases of severe seborrhoea with added staphylococcal infections still retain the tendency to seborrhoeic manifestations when the staphylococcus has been dealt with ; the same applies to acne. Cases with a focus of staphylococcal infection, such as an infected sinus or pyelitis, are, as Dolman has pointed out, in a different category, and may need surgical treatment. The dermatologist rarely encounters patients suffering from acute staphylococcal bacteriaemia, though this may complicate a severe carbuncle. For such patients, as for those suffering from acute osteomyelitis, antitoxin of high titre has been prepared, and has been used, especially in Canada, in such cases with success. The administration of antitoxin in the acute stage may well be followed during convalescence by injections of toxoid to stimulate and maintain the natural antitoxin of the patient at a high titre.

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X-RAY DIAGNOSIS OF ACUTE INTESTINAL OBSTRUCTION

BY

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(With Special Plate)

In the diagnosis of chronic incomplete obstruction *x*-ray examination after the giving of barium by the mouth or rectum is to-day a standard procedure, and needs no emphasis or comment. In the acute complete obstructions, however, the barium meal and enema are as a rule either impracticable or of little value, and surgeons have in the past relied almost entirely on bedside clinical evidence for their diagnosis. Recently, in an attempt to supplement this evidence, which in the early stages of intestinal obstruction may be slender, there has been a revival of the use of plain *x*-ray examination of the abdomen ; that is to say, an examination without any previous administration of radio-opaque substances.

During the past eighteen months we have submitted to plain *x*-ray examination of the abdomen all cases of acute intestinal obstruction or suspected obstruction which we have had the opportunity of investigating. We have also undertaken experiments in the post-mortem room to study the different *x*-ray pictures produced by varying degrees of distension at different intestinal levels. The present paper reports the results of this work, and attempts to assess the value of the test in the diagnosis of acute intestinal obstruction.

Literature

Plain *x*-ray examination of the abdomen as a diagnostic measure in intestinal obstruction was, according to Wangensteen, first described by Schwarz of Vienna in 1911. In 1915 Case in America published a paper on similar lines, and this was followed by a German contribution by Kloiber in 1919. Since 1920 several papers have appeared in America, references to which are given by McIver and by Wangensteen, but in this country the method has not excited much attention.

Method

The basis of the test is that gas and fluid, which can be recognized on plain *x*-ray examination of the abdomen,

accumulate in the intestine above an obstruction. Two *x*-ray pictures are taken, one in the supine and the other in the erect position. In the erect position the association of gas and fluid gives rise to a series of fluid levels (Figs. 1 and 2 on Plate). With a tilting *x*-ray table this position is possible even with an acutely ill patient. Should such a table not be available, and the patient be too ill to stand, a similar picture can be obtained by turning the patient on his side and taking an antero-posterior radiograph in this position. Pictures taken in the supine position are the best for revealing the presence, amount, and distribution of gas in the intestine.

As regards the interpretation, the only fluid level usually seen in a radiograph of the normal abdomen is in the stomach. In occasional cases, however, fluid levels may be noted in grossly atonic colons. Apart from this, the presence of fluid levels in the erect or lateral position points to intestinal obstruction, either mechanical or paralytic. In the supine position the colon and stomach are the only parts of the normal alimentary canal which usually contain gas detectable by *x*-ray examination. In obstruction of the colon this gas is considerably increased in amount (Fig. 3). The normal small intestine usually shows no gas on *x*-ray examination—in occasional cases small amounts may be seen—but gross gas in the small intestine points to some form of intestinal obstruction (Fig. 4).

Experimental Findings

First of all was studied the *x*-ray appearance after distension with air of isolated loops of intestine from different levels of the alimentary canal. Loops of intestine from six to twelve inches long from the upper jejunum to the pelvic colon were obtained from post-mortem subjects without abdominal disease. They were washed through, distended to varying degrees with air, and radiographed. Three different types of distension pattern were obtained —the jejunal, the ileal, and the colonic (Fig. 5).

The appearance of the jejunum with its mucosal folds is typical ; it is usually described as "herring-bone pattern" (Fig. 5, uppermost coil). About ten feet below the duodeno-jejunal junction the lines made by the mucosal folds become sparse, and nearly all the ileum shows a plain rather than a herring-bone pattern (Fig. 5, second coil). This is not due to obliteration by overdistension, for loops distended so little that their walls are no more than separated do not reveal a greater number of folds.

The pattern of the colonic loops is distinctive (Fig. 5, bottom two coils). The sacculations produce a wavy bird's-wing outline of the walls ; the corresponding mucosal folds are seen as lines running round the bowel, each at a trough between two waves, but not usually encircling the bowel as do the mucosal folds of the small intestine. In the pelvic colon, however, more of the mucosal folds encircle the bowel. The level of isolated loops of distended intestine can thus be readily recognized on *x*-ray examination.

Since obstructed intestine is distended not only with gas but with fluid, the *x*-ray picture produced by distending isolated loops with varying amounts of air and water was next studied. In the vertical position this combination causes fluid levels to show up, but in the flat position the only effect of the addition of water was an obscuring of the mucosal pattern, until eventually with a very large proportion of water the mucosal pattern entirely disappeared. This agrees with the observation that strangulated loops usually cast no gas shadows, for they are chiefly distended with fluid, and that only the dilated coils above the strangulated loops are visible in a plain *x*-ray picture.

The final experimental procedure was to distend the intestine *in situ* in post-mortem subjects by means of tubes introduced at different levels. When the jejunum or colon was distended the characteristic pattern at once indicated the site of distension. It is interesting to note that the distension of the large bowel was always greatest in the caecum, no matter how far below it the gas was introduced. This agrees with clinical experience in obstruction.

When several feet of lower ileum were distended there was some difficulty in identifying the nature of the coils, and in distinguishing them from large bowel. When both the colon and the ileum were distended the dilated colon was easily recognized, but again it was more difficult to identify the ileum. The crossing of convoluted ileal coils produced an appearance which resembled superficially colonic sacculations. Careful examination usually permitted a differentiation between the colon and the ileum, but there is no doubt—partly because of the absence of a typical mucosal pattern in the ileum, and partly because of the simulation of sacculation by overlapping ileal coils—that distended ileum *in situ* is sometimes difficult to recognize with certainty, and to distinguish from colon.

Clinical Features

The clinical cases may be classified in three groups.

First, the cases in which a diagnosis of acute intestinal obstruction was made after the usual methods of examination, but in which a plain *x*-ray examination was performed as well to explore the possibilities of the test.

Secondly, the cases in which there was some doubt whether actual intestinal obstruction was present, and in which the *x*-ray examination was used as the deciding criterion—for or against operation.

Thirdly, certain other abdominal disorders were examined as a control to the first two groups.

In the definite cases of obstruction the findings confirmed those of earlier workers, and also of the post-mortem experiments. In obstruction of the colon and of the jejunum the pictures were not only diagnostic but also, in most cases, indicated the site of the obstruction. In obstructions of the ileum different types of distension pictures were met with. In the earliest cases a solitary coil of ileum was seen, smooth in outline like the isolated post-mortem loops. This type of picture required careful examination to avoid confusing the distended ileal loop with normal colon. The pictures in later cases of ileal obstruction depended on how low in the ileum the obstruction was situated. If it was fairly high the characteristic jejunal pattern showed up above the ileum. If the obstruction was low in the ileum, or involved large gut and terminal ileum, the overlapping distended coils of smooth ileum gave rise to what may be described as a bubbly appearance (Fig. 2). In some cases the distended ileal coils could be seen arranged in the typical " ladder pattern " (Fig. 4). As in the post-mortem experiments, therefore, distended ileum proved to be the most difficult to recognize *in situ*.

The *x*-ray test was very valuable in the group of cases in which the diagnosis after the usual methods of examination remained doubtful. Thus in two cases a diagnosis of intestinal obstruction was made from the *x*-ray picture, and immediate operations were performed which might otherwise have been postponed. Again, in several cases negative *x*-ray findings were accepted as the decisive factor against the diagnosis of intestinal obstruction—for example, in a case of abdominal carcinomatosis with vomiting, in a suspected intussusception, and in a case of salpingitis with reflex vomiting. In one case, however, the *x*-ray findings were misinterpreted, and as a result a diagnosis of intestinal obstruction was not made until after considerable delay. This was a case of ileal obstruction after appendicectomy, and it was this case that led to the post-mortem experiments described previously being undertaken. Reviewing the *x*-ray pictures of this case

in the light of subsequent experience, a distended coil of ileum could clearly be seen, but it was not recognized at the time owing to a lack of appreciation of the characteristics of the distended ileum. In this case also no examination in the vertical position was made.

Most of the control cases showed nothing resembling the obstructed cases. Reflex or paralytic distension of the colon, however, gave a similar gaseous distension pattern to that of organic obstruction. It is stated that the same applies to paralytic distension of the small gut, but in the present investigation there was no opportunity of confirming this. A case of chronic obstruction of the colon gave a similar picture to that of the acute obstructions, so that the test by itself does not indicate that the obstruction is complete.

Discussion and Conclusions

It seems clear that plain *x*-ray examinations of the abdomen provide a test for intestinal obstruction which, provided that the facilities are available, can be performed quickly and without undue disturbance of the patient, and which may give diagnostic information of the greatest value. In certain cases the information it gives may be decisive. On the other hand, it must be recognized that the test is occasionally associated with difficulties in interpretation. These diminish with experience and as the quality of the *x*-ray picture improves, but they may still be present even with a perfect picture and after a fair experience of the test. They are most marked in obstructions of the ileum. In addition, the test is no indication of the acuteness of the obstruction, nor does it distinguish between mechanical and paralytic obstructions.

The position at present would appear to be that in many cases a plain *x*-ray picture of the abdomen gives positive information which may not only enable a definite diagnosis of intestinal obstruction to be made, but may also indicate the level of the obstruction. In some cases it enables the diagnosis of intestinal obstruction to be made without indicating clearly the level; and in a small minority of cases the information is so equivocal that it must be ignored. On the negative side the test may indicate that intestinal obstruction is not the cause of the abdominal symptoms. One is naturally more hesitant to rely on negative information in any test, but taken in conjunction with other clinical evidence such negative information may provide the deciding factor against operation.

One important point has not been mentioned—namely, how soon cases of intestinal obstruction give positive *x*-ray findings. In the present series the earliest case was examined eighteen hours after the onset of the obstruction, when the typical picture was present. Wangensteen found in experiments in dogs that positive findings were present as early as four to five hours after the onset, but from the clinical point of view this question will have to be worked out more fully before the test can be properly evaluated. We are attempting to obtain further information on this point, but from our experience so far we are of the opinion that, in spite of the limitations indicated, a plain *x*-ray examination of the abdomen is a most valuable test, and worthy of being employed as a routine in all suspected cases of intestinal obstruction.

We have pleasure in thanking Mr. Eric Pearce Gould for kindly allowing us to investigate several of his cases. We are also glad to acknowledge our indebtedness to Dr. Graham Hodgson, honorary physician in charge of the department of radiological diagnosis at the Middlesex Hospital, and to Dr. Courtney Gage, honorary radiologist to the Hampstead General Hospital, for the help they and their departments have given us in the investigation.

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THE SIGNIFICANCE OF LEUCORRHOEA*

BY

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(*With Special Plate*)

Leucorrhoea may be defined as that degree of vaginal discharge (other than blood) sufficient to soil the clothes or necessitate the use of a sanitary napkin, and considered by the patient as an appreciable departure from her normal state. A small quantity of vaginal discharge is normal, and its features are best studied in the healthy virgin. It consists of a thick, white, highly acid fluid (*p*H 4.2 to 4.8) derived via the vaginal epithelium. The latter contains no glands, and therefore the word "secretion" is, strictly speaking, a misnomer. The acidity is due to lactic acid, which results from the utilization of glycogen, present in abundance in the epithelial cells, either by the action of Döderlein's bacilli or by non-bacterial enzymes. Microscopical examination of the discharge shows a homogeneous bacterial flora of Döderlein's bacillus and desquamated vaginal epithelium. The cervical secretion is thick, mucoid, and clear, normally scanty in amount, and is constantly and definitely alkaline, ranging in *p*H from 8 to 9. The secretion elaborated by the uterine endometrium is somewhat like water in colour and consistence, is alkaline in reaction, and of very little importance clinically.

Leucorrhoea is a very common complaint, and is most frequent in married, parous women. It is also encountered in married nulliparae, in virgins, and in children. The very mild degrees of excessive discharge, premenstrually, or temporarily during conditions of depressed general health, are of little clinical moment. Leucorrhoea is a symptom frequently producing much discomfort and distress, and by reason of its profuseness or persistence may make life miserable. Many women, however, are not anxious to discuss the symptom with their medical practitioner until matters reach such a stage that, despite their own efforts at treatment, the persistence of discharge compels them to seek advice. This delay, coupled with the fact that many women regard quite a considerable amount of vaginal discharge as normal, has often the effect of making the complaint one of long duration when advice is first sought. It is therefore of importance that the practitioner should have a clear understanding of the pathogenesis and treatment of the condition.

Sources of Discharge

An excessive discharge per vaginam may reasonably arise from any one of three sources—vagina, cervix, or uterus—and it is essential to consider the possible lesions and factors that may be productive of discharge from each of these sites.

Least commonly is the corpus uteri responsible, and in these cases polypi, submucous fibroids, or endometrial carcinoma may be found. Infection of the uterine cavity as a source of leucorrhoea is extremely rare. This has been proved conclusively by histological and bacteriological examination of the endometrium in a large number of cases. The general view that endometritis is a common condition and is often the cause of leucorrhoea is quite erroneous. Very rarely indeed is the Fallopian tube the source, but a watery discharge per vaginam may be encountered in tubal carcinoma.

Cervical infection following childbirth, abortion, or gonorrhoea is much the most frequent cause. The pathology responsible for these discharges consists of

* Post-graduate lecture delivered August 14th, 1935.

redundant hypersecreting glandular tissue, sometimes associated with insufficient drainage of the secretion. The organisms most often found (excluding gonococci) are diphtheroid bacilli, coliform bacilli, staphylococci, various anaerobes, and Gram-positive diplococci. On inspection, the cervix may be seen to be eroded or lacerated, or hypertrophied or ulcerated, and there is frequently chronic endocervicitis. The lacerated and infected cervix may be the precursor of carcinomatous change, and where there is suspicion that the latter may be present biopsy is essential. Syphilitic or tuberculous ulceration of the cervix is uncommon, but this possibility should be borne in mind. A tuberculous cervical lesion is rarely primary, but may be associated with tubal or uterine tuberculosis.

The Vagina as the Source

The vagina is a frequent source of leucorrhoea, the discharge being generally of infective origin and secondary to endocervicitis, although it is sometimes non-infective. Pathological conditions in this site which may produce the symptom are carcinoma, benign tumours, tuberculosis, and adenomatosis vaginae. Probably the most common form of discharge in the infective group is that due to the *Trichomonas vaginalis*. Although this parasite was first described by Donné in 1836, very little attention was paid to it as a pathogenic agent and as a cause of leucorrhoea until recent years. A considerable literature on *Trichomonas vaginalis* vaginitis has appeared since 1928, particularly in America.

The trichomonas is a flagellated protozoon which varies considerably in size, being usually larger than a polymorphonuclear leucocyte but smaller than an epithelial cell, and is best studied by means of hanging-drop preparations or by diluting a drop of vaginal discharge with a drop of normal saline on an ordinary glass slide. The organisms may readily be seen, on account of their characteristic movements, with the ordinary high-power lens. The discharge in this condition is almost invariably copious, watery, yellowish, finely frothy or foamy, and irritating. The vulva is frequently inflamed, and portions of the vaginal wall are covered with small, punctate, hyperaemic, or granular areas.

With the exception of the trichomonas, vaginal parasites as a cause of leucorrhoea are not of much importance. *Oxyuris vermicularis* may be found, especially in the vagina of neglected infants. Fungus infection of the vagina is rarely encountered. A simple catarrhal vaginitis may be productive of excessive discharge. In women who have passed the menopause this may be very persistent, and its causation is closely associated with the great diminution or complete loss of the vaginal defensive power, which is intimately related to atrophy of the epithelium, loss of glycogen, and scantiness or disappearance of Döderlein's bacillus.

Virginal Leucorrhoea

Leucorrhoea in young virginal women is often a difficult problem in practice. Mild degrees are not uncommon, and the condition readily clears up on general medical or tonic treatment, and, indeed, with no treatment whatsoever. When excessive and persistent it becomes very disturbing, apt to produce neurosis, and requires careful investigation. With a few rare exceptions virginal leucorrhoea may be divided into two groups: (1) infective, and (2) non-infective. In the infective group the majority of the cases are *Trichomonas vaginalis* infections, although such conditions as yeast or monilia vaginitis may be encountered.

Among the non-infective cases there is a group in which hormonal disturbance is strongly suggested, either by the individual's make-up or by gross menstrual dysfunction, such as prolonged or almost complete amenorrhoea. In other cases there is no obvious evidence of endocrine imbalance and no distinctive clinical features are noted. Sometimes the complaint dates from puberty, and excessive discharge may be noted before menstruation first begins. The laboratory findings in the two categories of leucorrhoea are summarized in the following table.

	Non-infective	Infective
Secretion... ...	White, viscid, cheesy	Grey-yellowish, fluid, frothy
Smear	Grade I flora (epithelial cells and Döderlein's vaginal bacillus)	Grade II or III flora (pus cells, trichomonas, and mixed bacterial flora)
Culture	Döderlein's bacillus	Profuse, mixed
Reaction ... ... (average pH)	4.4 (4.2—4.7)	5.6 (4.9—6.0)

Vaginal Discharge in Children

Vaginal discharge may be encountered in children, when it is frequently due to gonococcal vulvo-vaginitis. The susceptibility of the vagina in these cases is probably dependent on the absence at this stage of any protective vaginal mechanism ; for it has been shown by Cruickshank and Sharman[1] that after the first month of life, throughout childhood until puberty, the bacterial flora of the vagina is sparse and varied, glycogen is absent from the cells of the vaginal epithelium, and the normal discharge is scanty or absent, and, when measurable, alkaline in reaction. Contrasted with this, it is to be noted that gonorrhoeal vaginitis does not occur in the first two to three weeks of life, when a simple homogeneous flora of Döderlein's bacilli associated with a highly acid non-purulent " secretion " is present in the infant.

Leucorrhoea in pregnant women is not uncommon. Cruickshank and Baird (unpublished) have shown that in a series of pregnant women complaining of vaginal discharge, while *Trichomonas vaginalis* infection was not uncommon, in 39 per cent. the evidence was that the symptom was due entirely to an increased amount of the normal physiological " secretion." The causative factor in this process is hormonal, and is probably due to the progressively increasing elaboration of oestrin during pregnancy.

Investigation

Investigation of a case of leucorrhoea should consist first of inspection of the vulva, when the presence of redness or excoriation of the labia, or injection of the orifices of Bartholin's duct or of the urethra, should be noted. The naked-eye characteristics of the discharge as to colour and consistence should be observed. In simple vaginitis it is usually thin or semi-purulent ; in venereal disease it is thick and irritating ; and in malignancy it is frequently watery, malodorous, and blood-stained. When thin, yellowish, and finely frothy, it suggests *Trichomonas vaginalis* infection. Fresh-drop examination in saline will reveal these flagellates when present.

In all cases of doubt as to the nature and source of leucorrhoea, the reaction (H-ion concentration) should be estimated. This is very simply done by the use of a colorimetric apparatus such as the capillator (British Drug Houses), which gives information of much value. If the *p*H of the discharge is less than 5 it can be assumed with certainty that the discharge is of purely vaginal origin. A highly acid reaction such as this excludes gonorrhoea. On the other hand, if the *p*H of a vaginal discharge is greater than 6, it points strongly to the probability that the discharge is of cervical origin. A direct smear should be made and stained for bacteriological examination.

The recognition of particular types of organisms present in the vagina is seldom of much value, especially in the non-virgin ; but it is more convenient and helpful, in judging the nature of a discharge, to follow the plan

of recognizing three types of bacterial flora, or three grades (I, II, and III) of " cleanliness " (Reinheitsgrad). In Grade I there is a homogeneous bacterial flora of Döderlein's bacillus, occasionally accompanied by yeasts, and a highly acid (*p*H 4 to 4.4), whitish, cheesy secretion consisting of desquamated vaginal epithelium (Fig. 1 on Plate). Grade III, corresponding to Döderlein's pathological flora, contains several types of bacteria, such as diphtheroids, enterococci, staphylococcci, vibrios, and coliform bacilli, and is accompanied by a less acid and even alkaline discharge (*p*H 5.6 to 7.6) (Fig. 2 on Plate). Grade II is intermediate between these two, Döderlein's bacillus being present in association with one or more other bacterial types, while the *p*H of the secretion usually varies from 4.6 to 5.6.

The vaginal wall may show evidence of inflammation. The cervix should then be inspected for the presence of erosion, ulceration, laceration, or ectropion of the lips. When the cervix is infected a smear should be made and examined for the presence of gonococci. A careful bimanual pelvic examination will give information as to the condition of the uterus, tubes, and ovaries. Only when other causes can be excluded and an intrauterine cause suspected should the cervix be dilated and the uterus curetted.

Treatment

Treatment depends largely on the diagnosis of the source of the discharge. When the discharge is due to neoplasm involving uterine body or cervix or the vagina the growth must be removed. Where cervical infection is present it should be treated by cauterization or excision of the infected area or by amputation of the cervix. In cases of vaginal infection treatment consists in the local application of antiseptics to the vaginal wall, generally in the form of douches or instillations. *Trichomonas vaginalis* vaginitis is very resistant to treatment, which must be thorough and persistent, and should be carried out daily for seven to ten days at least. Devegan vaginal tablets, iodine, acriflavine, biniodide of mercury, and tincture of green soap are the most satisfactory agents. Particular care should be paid to treatment immediately after menstruation on account of the tendency to recurrence at this time.

Where the discharge is of non-infective origin local treatment is not likely to influence the condition. Theoretically, hormone therapy might prove of value, but we have tried many preparations and are not satisfied with their efficacy in this direction. Numerous varieties of tonic and vitamin preparations have been given, but the results have been inconstant and on the whole unsatisfactory. General medical treatment, however, may be employed. The tendency in non-infective cases to spontaneous remission and cure must be taken into account in assessing the value of any treatment. The important point is that it should not follow along the therapeutic lines necessary in cases of infective discharge. It must always be borne in mind that leucorrhoea is not a disease, but an expression of disease—that is, a symptom—and that the precise exciting cause must be determined. It is useless to perform a dilatation and curettage of the uterus in the majority of cases, for it is based on an erroneous conception of the source of the discharge, and may even be followed by infection. It must therefore be emphasized that in deciding the method of treatment in every individual case a careful clinical examination is essential, and a full laboratory examination of the discharge is very frequently of great value.

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MASSIVE COLLAPSE OF THE LUNG COMPLICATING HAEMOPTYSIS

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(With Special Plate)

Although the occurrence of massive collapse of the lung as a complication of haemoptysis is a well-recognized syndrome, there appears to be no review of this subject in the English literature. The first recorded description of this condition is that of Long[20] in 1875. No further reference to the syndrome could be found until 1925, when a case was published by Farris.[7] Gammons[9] described a case in 1926, but it was not until 1927 that a more detailed description of this condition was given by Benedetti.[1] In the following year further cases were reported by Jacobaeus[15] and Samson,[29] and in 1934 Benedetti[2] was able to collect twenty-seven cases from the literature. A short summary of the cases recorded up to May, 1935, will be found at the end of this paper.

Case Report

A lad aged 18 was admitted to Westminster Hospital under Dr. Hildred Carlill on October 1st, 1934, with haemoptysis. His father suffers from phthisis. In March, 1930, he had been an in-patient at Westminster Hospital for six weeks suffering from rheumatic fever, and was then thought to have early mitral disease. Following his discharge he remained in good health until August, 1934, when for the first time he had a haemoptysis. This recurred at intervals, and necessitated his remaining in bed for varying periods up to a week. On September 29th he coughed up about a cupful of bright red blood, and on the next day complained of left thoracic pain and dyspnoea. In the twenty-four hours preceding admission morphine (3/4 grain) had been given.

On admission he was found to be moderately cyanosed. His breathing was rapid, shallow, and painful. His temperature was 102° F., and his pulse rate 110 per minute. There was no oedema or other evidence of congestive cardiac failure, and no clubbing; his general condition was good. The left side of his chest showed diminished movement, an impaired percussion note, particularly at the base, and reduction in the vocal fremitus. On auscultation the breath sounds on the left side were reduced anteriorly, and distant tubular breathing was audible over a small area posteriorly. A few rales and a friction rub were heard in the left axilla. The cardiac impulse was in the fourth left interspace just outside the mid-clavicular line. A systolic murmur was heard over the mitral area. A radiograph (Fig. 1 on Plate), taken by portable apparatus on the day of admission, showed a patchy density at the left base suggesting pneumonia; the heart, however, was displaced to the left.

Two injections of morphine (1/4 grain) were given on the first day, and an almost equivalent amount was administered with atropine during the next twenty-four hours. The haemoptysis continued, and the sputum contained many clots. On October 3rd the signs in the left lung had altered considerably. There was definite flattening over the whole left side of the thorax, with marked hollowing below the left clavicle. The trachea and cardiac impulse (five and a half inches from the mid-line) were displaced to the left. The percussion note was dull, particularly at the base, the impairment extending as high as the clavicle. Respiratory movements were abolished on that side, and the breath sounds and vocal fremitus were almost absent, except for the small basal patch of tubular breathing. A few rales and faint pleural friction were still audible in the left axilla.

The clinical diagnosis of massive collapse of the left lung was made. On October 4th an *x*-ray examination (Fig. 2 on Plate) showed that the left side of the chest was completely opaque, with the heart and trachea still further displaced to the left. The left side of the diaphragm was raised, and the left bronchus appeared to be occluded about one and a half inches beyond the bifurcation. The right lung was

more translucent than normal, and could be seen extending as a relatively clear area to the left of the vertebral column. The radiological diagnosis was that of complete collapse of the left lung.

The haemoptysis gradually diminished from October 5th to the 8th, and towards the end of this period mainly dark blood clot was coughed up. After about one week the left lung showed definite signs of re-expansion. The flattening disappeared, except at the apex, the impairment became less marked, particularly at the base, and there was improvement in the air entry and in the vocal fremitus and resonance. Many rales were audible over the left lung. The cardiac impulse and trachea slowly returned to their normal positions. An *x*-ray examination on October 9th showed the left lung to be aerating and the shadow of the left bronchus to be more distinct.

The patient continued to improve, but pyrexia (up to 102° F.) persisted for about one month. The pulse rate remained raised (90 to 110), and the respirations rarely fell below 30 per minute. The sputum was free from blood about the third week in October, and had practically ceased early in November. Despite the gradual disappearance of abnormal signs from the left base, the persistent flattening at the left apex continued with diminished movement, dullness, increased vocal fremitus, bronchial breathing, crepitations, bronchophony, and whispering pectoriloquy. Further *x*-ray examinations on October 18th and November 3rd showed progressive improvement of the left lower lobe, with decreases in the displacement of the heart and trachea. The left upper lobe appeared, however, to be more collapsed.

The following additional investigations were performed. The sputum, examined on three occasions, showed no tubercle bacilli. The results of a blood count on October 16th were: haemoglobin, 80 per cent.; red blood cells, 4,600,000; and white blood cells, 8,000. A blood culture (to exclude malignant endocarditis with pulmonary infarction) proved negative. In view of the negative sputum tests and absence of clear evidence of mitral stenosis, the possibility of a bronchial neoplasm was considered, but bronchoscopy (performed by Mr. C. P. Thomas) on November 2nd showed no abnormality.

The patient when discharged on November 11th was afebrile. He had gained 7 lb. in weight, and, apart from a slight cough, had no symptoms. The signs at his left apex persisted, and his pulse rate never fell below 90. During the next few weeks his cough and expectoration again became troublesome, although there was no further haemoptysis. He lost weight, his appetite deteriorated, and he complained of night sweats. An *x*-ray examination on November 26th showed infiltration of the left upper lobe, and in January, 1935, tubercle bacilli were found in the sputum for the first time.

He was admitted again in February, 1935, and was found to have an evening temperature of 99° to 100°; the physical signs at the left apex were unaltered. Artificial pneumothorax was initiated, and *x*-ray examinations at the time of his discharge to a sanatorium showed good collapse of the lower lobe, but the upper lobe was adherent and incompletely collapsed. There was marked improvement in the patient's condition; his cough had diminished, his weight had increased, and his temperature had become normal.

A report received from the sanatorium in August, 1935, states that he continues to improve, although the upper lobe remains adherent, and a few tubercle bacilli are still present in the sputum.

Discussion

Collapse after haemoptysis is infrequently diagnosed, although most writers consider it a not very rare occurrence. The faulty diagnosis of many cases may be due to the fact that patients with haemoptysis are too ill to be subjected to careful clinical examination, that radiological examination is not usually possible, and that the unilateral thoracic flattening and cardiac displacement characteristic of collapse can easily be mistaken for old tuberculous fibroid changes.

Causation of Collapse

Most authors have regarded this form of massive collapse as being due to the mechanical occlusion of a large bronchus by blood clot, followed by the absorption of the air in the lung beyond the block. This view is supported by the fact that reinflation of the collapsed lung does not usually occur until the offending clots have been expelled; the expulsion of a bronchial cast composed of blood coagulum (cf. Wilson[38] and Stoichitza[33]) is followed by the clearing up of the condition within a few days.

Benedetti, however, believes that all varieties of massive collapse are due essentially to the active contraction of the lung tissues, resulting from the reflex nervous stimulation of the smooth muscle, especially that around the respiratory bronchioles. According to his theory, in the cases following haemoptysis, this reflex is set up by the presence of free blood in the bronchi. He even maintains that the clot found in such cases, so far from being the cause of the collapse, is a secondary effect resulting from stagnation of blood in the bronchi of the collapsed area. Following the bronchial spasm, he believes that there is a progressive absorption of the alveolar air with active retraction of the alveolar walls. Reinhardt[24] has demonstrated that such reflex contraction of the lung is accompanied by marked hyperaemia, which accelerates the absorption of the alveolar air.

Benedetti claims in support of his views that, were post-haemoptoic collapse due merely to bronchial obstruction, it should occur with much greater frequency. He points out that most cases are found in patients with early pulmonary lesions, the contractility of whose lungs is probably unimpaired.

The following observations of Jacobaeus and Westermark[16] are confirmatory. These authors examined the *x*-ray and clinical histories of twenty-one patients who had been treated for haemoptysis at their clinic over a period of three years, and found massive collapse in four. In these the history of previous pulmonary disease was relatively short, and in three of them the haemorrhage had been a large one (over 300 c.cm.). A study of the reported cases shows that haemoptysis was the first symptom of tuberculosis in many, though in a few there were already well-established lesions. Jacobaeus believes that it is a spasm of the bronchi which determines the resulting collapse, and that this spasm occurs more readily in patients with healthy bronchi. He has shown that the injection of lipiodol into diseased lungs rarely causes collapse, whilst its introduction into the bronchi of eight healthy individuals was followed by massive collapse in three cases.

In further support of the theory of reflex bronchial spasm as a cause of massive collapse may be mentioned the extreme rapidity with which atelectasis sometimes manifests itself after a lipiodol injection—according to Jacobaeus, in ten to fifteen minutes. When, however, a bronchus is completely obstructed experimentally (for example, by a rubber ball), collapse does not follow for four to six hours; it is again suggested that it is the active expulsion of air from the lung which accelerates the process in some of the cases following haemoptysis. Furthermore, rapid re-expansion of a collapsed lung can occur even when the lipiodol or blood has not been coughed up, as in the case described by Muller,[23] suggesting that the obstruction has been relieved by the termination of the spasm.

General Features

Most of the cases have occurred in young adults, more commonly in men; in the large majority, including the author's case, pulmonary tuberculosis was the cause of the haemoptysis. Stivelman[34] in a study of 5,000 cases of pulmonary tuberculosis, found acute massive collapse in four, and all of these were due to haemoptysis. Long[20] is the only authority to record a case following mitral stenosis. In the example quoted by Wolaj[39] the bleeding

was due to bronchiectasis. Moersch and Berkman[21] reported a case resulting from severe hypertension, and Gutierrez and Huelves[12] one of obscure aetiology in which the haemoptysis manifested itself in a girl aged 13 during menstruation. Urgoiti and Caruncho[26] recorded a very similar case to the latter, in which, however, it was difficult to exclude phthisis. Cordier's[4] patient suffered from congenital syphilis, while Morlock and Scott Pinchin[22] described three cases associated with bronchial tumour, in which the haemorrhage followed the use of diathermy.

Both lungs have been equally involved ; the collapse has extended throughout the whole of one lung, or the lower lobe has been mainly affected. Although the occurrence of small areas of lobular collapse in haemoptysis should be frequent, it has recently been shown by Richter, van Allen, and Lindskog[25] that the presence of canaliculi in the alveolar septa between the lobules makes it difficult or impossible to produce atelectasis by obstructing the bronchioles to individual lobules, and that it is only by the blocking of the larger bronchi that collapse can result. Sante,[30] Stivelman, and others, however, draw attention to fleeting *x*-ray shadows following haemoptysis, which they regard as areas of lobular collapse.

Massive collapse in the majority of cases has been on the same side as the lesion responsible for the haemoptysis, although Morlock and Stivelman both record its occurrence in the contralateral lung. The retention of blood in the bronchi, with resulting collapse, is favoured by the shallow breathing and restricted movement of these patients, and particularly by the abolition of the cough reflex by large doses of morphine.

Clinical Picture

The symptoms of massive collapse complicating haemoptysis are not infrequently masked by those of haemorrhage. There is usually moderate, occasionally marked, dyspnoea, and slight cyanosis. The patient may complain of thoracic pain on the affected side. A varying degree of pyrexia is common, and the pulse rate is raised. This toxic reaction may be evidence of the absorption of blood, or may be due to the spread of infection to previously healthy areas of lung. The physical signs of massive collapse usually manifest themselves within twenty-four hours of the preceding haemoptysis, and resemble very closely those found in post-operative collapse.

The affected side is considerably flattened, particularly below the clavicle, and movement is diminished or absent. There is reduction in the vocal fremitus and resonance, and the percussion note is markedly impaired over the collapsed area. The breath sounds are commonly diminished or absent, but occasionally may be bronchial. Rales, while present in the pre-atelectatic stage, usually disappear with complete collapse. Of considerable importance in the diagnosis is the displacement of the heart and trachea to the affected side. The trachea alone may be displaced if the collapse affects only the upper lobe. Stoichitza found in his case systolic retraction of the intercostal spaces over the cardiac impulse, and fixity of the latter with change of posture. He attributes the first of these signs to the fact that, whereas the potential space which occurs when the heart contracts is normally filled in by lung, this can no longer occur when the latter is collapsed, so that the chest wall is sucked in during systole. The fixity of the cardiac impulse is due to the considerable reduction in the thoracic space produced by the displaced mediastinum and high diaphragm, as well as to the abnormal force acting on the heart. Signs of compensatory emphysema are found over the opposite lung.

Radiological Picture

The *x*-ray picture, which is usually characteristic, confirms the diagnosis. There is narrowing of the thorax and intercostal spaces on the affected side, the ribs are more oblique, and the mediastinum, with the heart and trachea, is displaced towards the collapsed lung. The latter is revealed as a dense homogeneous shadow. The opacity of the collapsed lung is greater in obstructive atelectasis than in pneumothorax ; this is believed by Fleischner[8] to be due to the outpouring of fluid into the alveoli. If only one lobe is affected the lower margin is usually sharply defined, while the upper edge is indistinct and mottled. The diaphragm is raised on the affected side, and may be unidentifiable if the collapse involves the right lower lobe. The opposite lung, more translucent than normal as a result of compensatory emphysema, may extend across, and be visible as a relatively clear area on the affected side (Fig. 2). On screening, the collapsed chest wall and raised diaphragm are seen to be relatively immobile, and on inspiration the mediastinum moves further towards the affected side. This important sign of pulmonary collapse was first described by Westermark.

Jacobaeus and other observers have noted that, when attempting an artificial pneumothorax for therapeutic purposes in these patients, the initial negative pressure in the pleural cavity is unduly high ; it may reach -30 c.cm. H_2O on expiration and -40 c.cm. on inspiration. This high negative pressure is an important confirmatory sign of collapse. It is due to the marked diminution in the volume of the lung, which increases the disproportion between it and the thoracic cage. The pressure in the opposite pleural cavity is now relatively higher, and displaces the mediastinum towards the affected side. The pushing up of the diaphragm by the intra-abdominal pressure and the forcing in of the chest wall by the atmospheric pressure from outside are similarly explained. This negative pressure becomes still higher during inspiration as a result of the increased capacity of the thorax, so that the mediastinum is still further displaced, causing the pendulum movement described by Westermark.

Course and Prognosis

With the removal of the blood clots causing the obstruction the collapsed lung expands again, and the clinical and radiological signs gradually disappear. This has occasionally occurred with remarkable rapidity. In most cases the cause of the haemoptysis has been revealed with the disappearance of the *x*-ray shadow of collapse. Re-expansion is usually complete, and the immediate prognosis is good. Stivelman believes that the collapse exercises a beneficial effect on the haemorrhage by compressing the bleeding vessel, provided that the source of haemorrhage is on the same side as the collapse. When the contralateral lung is collapsed urgent dyspnoea may arise. In the non-tuberculous cases the ultimate prognosis does not appear to be affected by the haemoptysis.

In the tuberculous group the subsequent history varies. In one case, described by Jacobaeus, the patient died within two weeks of the onset with acute pneumonic tuberculosis, while Rosenblatt's[26] patient died ultimately from an acute miliary spread, although recovering from the massive collapse. The tendency for tuberculous lesions to spread soon after the collapse has been observed in several other cases, as for instance in that described by the author. This is partly due to the dissemination of tubercle bacilli by the haemoptysis. Muller, contrasting the spread of infection in post-haemoptoic collapse with the beneficial effect produced by artificial pneumo-

thorax, ascribes this difference to the more rapid interference with bronchial drainage in the former group.

Jacobaeus has observed a progressive increase in the size of apical cavities following massive collapse. He attributes this phenomenon to the high negative intrapleural pressure exercising a traction effect on the walls of the cavities and bronchi. He recommends artificial pneumothorax on the affected side as a means of neutralizing the effects of this high negative pressure. Artificial pneumothorax has also been practised in such cases by Wilson, Glenn,[11] and others, and has been justified by the fact that lesions have become quiescent, and acute symptoms due to mediastinal displacement have been relieved.

Occasionally cavities in the collapsed lobe itself have been observed to become smaller as the result of the atelectasis. (See Case 14 in Table.) The effect of collapse on the size of a cavity thus probably depends on its position in relation to the collapsed lobe. Corrylos[5] has shown that the healing of tuberculous foci is greatly favoured by the occlusion of the bronchi draining the diseased areas. This results in the absorption of the air in the cavities, with collapse of their walls, and also creates an anaerobic medium unfavourable to the growth of tubercle bacilli. He regards the beneficial effects produced by artificial pneumothorax as being largely due to this bronchial occlusion.

Case	Date of Publication	Author	Sex and Age of Patient	Side and Lobes Involved	Cause of Haemoptysis	Remarks
1	1875	M. Long [20]	F., 20	Left (complete)	Mitral Stenosis	Haemoptysis about 300 c.cm. Rapid re-expansion
2	1915	H. A. Farris [7]	M., 22	Right (complete)	Phthisis	Chronic collapse of upper lobe followed by haemoptysis with acute collapse
3	1926	H. F. Gammons [9]	M., 30	Right (upper)	Phthisis	A.P. induced with relief of symptoms
4	1927	P. Benedetti [1]	F., 16	Right (complete)	Phthisis	Haemoptysis about 300 c.cm. Rapid re-expansion. A.P. for phthisis followed by healing of lesion
5	1928	N. Samson [29]	M.	Right (complete)	Phthisis	Rapid re-expansion revealed apical lesion
6	1928	H. C. Jacobaeus [15]	M., 27	Left (complete)	Phthisis	Haemoptysis 650 c.cm. Rapid re-expansion. Death two weeks later from tuberculous bronchopneumonia
7	1928	H. A. Bray [3]		Right		No further details
8	1928	Sampson [28]				No further details
9	1929	E. Kylin [18]	M., 29	Right (complete)	Phthisis	A.P. to control haemorrhage. Initial pressure −30 c.cm. −40 c.cm. H_2O
10	1929	J. L. Wilson [38]	F., 23	Right (complete)	Phthisis	Haemoptysis 480 c.cm. Expectoration of bronchial blood casts with rapid re-expansion. Small effusion. Air replacement. Pleural pressure −10 c.cm. −12 c.cm. H_2O
11	1929	H. Hennell [14]	F., 29	Left (complete)	Phthisis	Rapid re-expansion. Bilateral phthisis
12	1929	G. Gherardini [10]	F., 17	Right (complete)	Phthisis	A.P. to control bleeding. Initial pressure −25 c.cm. H_2O
13	1929	Jacobaeus, Selander, Westermark [17]	M., 30	Right (complete)	Phthisis	Haemoptysis about 400 c.cm. A.P. (1,000 c.cm.) relieved dyspnoea. Initial pressure −30 c.cm. H_2O
14	1929	Jacobaeus, Selander, Westermark [17]	M., 28	Right (upper)	Phthisis	Right apical cavity present before collapse. Size diminished with collapse, but increased again with A.P., owing to persistent adhesions
15	1930	C. Mulker [23]	M., 19	Left (complete)	Phthisis	Collapse cleared up rapidly without expectoration; recurred; cleared up slowly, revealing apical lesion. A.P. performed
16	1930	Jacobaeus, Westermark [16]	M., 26	Right (inferior)	Phthisis (probably)	Haemoptysis 500 c.cm. Rapid re-expansion with complete recovery
17	1931	E. E. Glenn [11]	F., 33	Left (inferior)	Phthisis	Good progress with A.P. Initial pressure −12 c.cm. −15 c.cm. H_2O
18	1931	E. E. Glenn [11]	F., 18	Left (inferior)	Phthisis	Improvement with A.P. Initial pressure −15 c.cm. −18 c.cm. Adhesions prevented complete apical collapse
19	1931	J. Douglas [6]		Right (inferior)		No further details
20	1931	A. Hartung [13]	M.	Left (complete)	Phthisis	Re-expansion followed coughing up of two pieces of calcified tuberculous tissue plus blood
21	1932	L. Sayé [30]	M., 18	Left (complete)	Phthisis	Rapid re-expansion. Apical lesion
22	1932	L. Sayé [30]	M., 20	Right (inferior)	Undetermined	Haemoptysis 300 c.cm. Rapid re-expansion
23	1932	E. Kylin [19]	M., 19	Left (complete)	Phthisis	A.P. induced. Initial pressure −24 c.cm. −30 c.cm. H_2O
24	1932	E. Kylin [19]	M., 51	Right (upper and mid.)	Phthisis	Haemoptysis 200 c.cm. A.P. induced. Initial pressure −14 c.cm. −19 c.cm. H_2O
25	1932	L. Sokol [32]	F., 21	Right (complete)	Phthisis	Massive collapse during course of A.P. for haemoptysis, only 500 c.cm. air having been introduced
26	1932	B. P. Stivelman [33]	M., 27	Right (complete)	Phthisis	Apical lesion left side. Slow re-expansion of right lung
27	1932	H. J. Moersch, J. M. Berkman [21]	M., 44	Right (inferior)	Hyperpiesis	Rapid re-expansion followed bronchoscopy
28	1933	J. Rosenblatt [26]	M., 19	Left (complete)	Phthisis	Haemoptysis 150 c.cm. Rapid re-expansion. Death six months later from miliary tuberculosis
29	1933	N. Stoichitza [35]	M., 20	Left (complete)	Phthisis	Re-expansion rapid, revealing lesion at hilum. Pleural pressure −10 c.cm. −15 c.cm. H_2O
30	1933	J. Wolaj [39]	M., 19	Right (inferior)	Bronchiectasis	Lipiodol prior to haemoptysis revealed bronchiectasis. Pleural pressure −2 c.cm. −8 c.cm. H_2O
31	1933	P. Coryllos [5]	M., 26	Right (upper)	Phthisis	Collapse more marked after one month. A.P. three months later
32	1933	A. C. Ruiz, U. G. Gil [27]	34	Left (upper)	Phthisis	Insidious onset of collapse. A.P. after some months. Initial pressure −36 c.cm. −40 c.cm. H_2O
33	1934	V. Cordier, P. Bouquin [4]	M., 17	Right (complete)	Undetermined	A case of congenital syphilis. Complete re-expansion
34	1934	P. Benedetti [2]	M., 20	Left (complete)	Phthisis	Haemoptysis followed trauma to chest. Re-expansion revealed left apical lesion. A.P. induced five weeks later
35	1934	A. Urgoiti, P. Caruncho [36]	F., 13	Left (complete)	Undetermined ? Tuberculous	Haemoptysis started during menstruation. Re-expansion, following expectoration of bronchial cast, revealed left hilar shadow
36	1934	R. N. Gutierrez, E. C. Huelves [12]	F., 13	Left (complete)	Undetermined	Rapid re-expansion. Haemoptysis started during menstruation
37	1934	H. V. Morlock, A. J. Scott Pinchin [22]	M., 45	Right (upper)	Bronchial tumour	
38	1934	H. V. Morlock, A. J. Scott Pinchin [22]	F., 40	Left (complete)	Benign bronchial tumour	Haemorrhage induced by diathermy to growth. Lung re-expanded
39	1934	H. V. Morlock, A. J. Scott Pinchin [22]	F., 23		Benign bronchial tumour	Haemorrhage induced by diathermy
40	1934	H. V. Morlock, A. J. Scott Pinchin [22]	M., 16	Left (complete)	Phthisis	Rapid re-expansion revealed mid-zone lesion
41	1934	H. V. Morlock, A. J. Scott Pinchin [22]	F., 20	Left (complete)	Phthisis	Right apical lesion. Collapse in contralateral lung
42	1935	J. Mindline	M., 18	Left (complete)	Phthisis	Rapid re-expansion revealed apical lesion. A.P. performed later

Diagnosis

The possibility of a massive pulmonary collapse should always be borne in mind in patients with a moderate or copious haemoptysis and a history suggestive of recent phthisis. The marked pyrexia and dyspnoea in some of the cases may result in an erroneous diagnosis of tuberculous bronchopneumonia and in a bad prognosis being given. The cardiac and tracheal displacement, the characteristic *x*-ray appearances, and the subsequent favourable course, with the disappearance of the dense radiological shadow, should avoid this confusion.

It is now recognized that, in addition to the acute collapse associated with haemoptysis, pulmonary tuberculosis may cause a chronic collapse of a lobe or lung as the result of stenosis of the bronchi produced by tuberculous changes in the walls or lumen, or of pressure on the bronchus by tuberculous tracheo-bronchial glands. While the healing of tuberculous glands usually determines the clearing up of the atelectasis, the other causes mentioned frequently result in the condition becoming established, with the supervention of secondary fibrosis giving the appearance of extensive unilateral fibroid phthisis.

The retracted chest wall and displaced mediastinum might lead to acute massive collapse being diagnosed as pulmonary fibrosis. The latter, however, is commonly bilateral. Vibert and Sergent,[37] discussing the *x*-ray differences between these two conditions, state that in atelectasis the deviation of the trachea is linear and not sinuous, and that the raised diaphragm is regular in outline and not scalloped by adhesions, it being free and capable of small swaying movements. The best method, however, of distinguishing the two is by attempting to induce an artificial pneumothorax ; the characteristic high negative pressure will then be registered in collapse, whereas the presence of a pleural adhesions in pulmonary fibrosis will probably prevent any reading from being obtained. Since artificial pneumothorax has been shown to benefit the various forms of massive collapse occurring in pulmonary tuberculosis, it is important not to diagnose such a case wrongly as pulmonary fibrosis, and thus be deterred from attempting artificial pneumothorax owing to the expectation of finding pleural adhesions. The characteristic signs and *x*-ray picture should also distinguish the condition from lobar pneumonia with haemoptysis, pulmonary infarction, pleural effusion, and pulmonary neoplasm.

The diagnosis of tuberculosis as a cause of the haemoptysis may be delayed if the shadows of tuberculous infiltration are mistaken for residual atelectasis, and tubercle bacilli remain absent from the sputum for a considerable period as occurred in the case recorded above. The possibility of a bronchial carcinoma producing the collapse may have to be excluded by bronchoscopy.

Treatment

Since massive collapse is undoubtedly favoured by the abolition of the cough reflex by morphine, Morlock and Pinchin advise that opiates should not be administered in haemoptysis, except where it is due to incurable diseases such as extensive tuberculosis, carcinoma of the lung, or aneurysm. They point out that the haemoptysis in early tuberculosis is rarely severe enough to endanger life, and that much more harm may result from the spread of the tuberculous infection and from the pulmonary collapse.

The use of artificial pneumothorax as a therapeutic measure has been already discussed. In the tuberculous cases the frequent unilateral distribution of the pulmonary lesion, the beneficial influence of pneumothorax on the haemoptysis, and its ultimate effect in arresting the disease justify such treatment. Where the condition is not tuberculous, or if the cause of the haemoptysis is obscure and the haemorrhage not serious or repeated, a conservative policy should be adopted, since the patient will usually remain well following the re-expansion of the collapsed lung. The expulsion of the blood clot and reinflation of the lung may be assisted by the administration of expectorants and carbon dioxide.

Summary

1. A case of massive collapse of the left lung following haemoptysis in the course of early pulmonary tuberculosis is reported.

2. Forty-one similar cases have been collected from the literature, and the characteristic signs and symptoms of the condition are described.

3. Two possible aetiological factors are mentioned: bronchial occlusion by clot, and reflex bronchial spasm.

My thanks are due to Dr. Hildred Carlill and Dr. Ernest Lloyd, under whose care the patient was, for permission to publish this account.

This case was shown at the meeting of the Section of Medicine of the Royal Society of Medicine on April 2nd, 1935.

NOTE.—Since this article was written, my attention has been drawn to a further case (not included in the table). Case 43: Gatterdam, E. A. (*Radiology*, 1933, xxi, 251). Complete left collapse. Male, aged 36, with phthisis. Haemoptysis with collapse followed phrenic avulsion.

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The Out-patient Department of St. John's Hospital for Diseases of the Skin has been transferred from 49, Leicester Square, where it has been housed since the year 1863, to much larger premises at 5, Lisle Street, Leicester Square, W.C.2. The date of the transfer is Friday, December 20th, and the new department will be open to patients on Wednesday, January 1st, 1936.

ANTE-NATAL DIAGNOSIS OF QUADRUPLETS

BY

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SENIOR RADIOLOGIST, ROYAL FREE HOSPITAL

(With Special Plate)

During the last ten or twelve years the radiological diagnosis of twins or triplets, at any time after the sixth month of pregnancy, has come to be looked on as part of the ordinary routine work sent up from the maternity departments. It is thought, however, that the diagnosis of quadruplets two months before birth is still uncommon enough to merit a brief article.

A fairly extensive search of the literature on the subject has revealed only one other instance of the *x*-ray diagnosis of quadruplets before birth up to the present time. This was in Manchester in 1934, and in this case the skiagraphic picture, though establishing the fact of four foetuses being present, was not, so far as I can ascertain, reproduced in any medical journal.

Radiological Aspects

The following few notes record shortly the radiological aspects of my case.

On August 21st, 1935, Mrs. H., a multipara aged 34, was sent to the *x*-ray department of the Royal Free Hospital with a clinical diagnosis of "? twins." The skiagram showed at once that quadruplets were present. One, hereafter called Foetus A, was a vertex with the head very low in the pelvis. Foetus B was a breech with flexed legs, lying well over to the left of the maternal abdomen. Foetuses C and D were lying head to tail transversely on the right side of the abdomen, both well above the level of the right iliac crest. The shadow of the head of the upper one, Foetus C, reached to the level of the eleventh rib.

All four foetuses were apparently well formed, A and D being equal in size, and smaller than B and C, which were again of equal size.

Clinical data as to the duration of pregnancy were conflicting, but from a skiagraphic standpoint it appeared that the general ossification was that of foetuses of about thirty weeks, but their size, as was to be expected, was only that of twenty-six weeks.

The suboccipito-bregmatic measurements at this time were: A, 2.8 inches; B, 2.7 inches; C, 2.75 inches; and D, 2.85 inches.

There did not seem to be any excess of liquor amnii.

On September 18th the patient was *x*-rayed again, and the quadruplets were seen to have grown considerably and to have altered their position.

Foetus A was still a vertex, with head well down in the pelvis, but B, C, and D were now all breeches, lying side by side in the upper part of the uterus, with their heads more or less on the same level. C was in the middle, with B and D having their backs to it, and the upper parts of the body curved symmetrically away. The general appearance, as can be seen from the illustration on the Plate, is strangely like three tulips in a vase.

The general ossification of the skeleton had progressed considerably, all the foetuses had grown well, and the heads now measured: A, 3.5 inches; B, 3.3 inches; C, 3.4 inches; and D, 3.5 inches.

It will be seen at once that the ratio of head diameters has been kept, but the actual increase of the size of the head shadows is 0.75 inch in each case. The usual increase in size of the foetal head in the last months of pregnancy is 2/5 inch per month. The discrepancy of 3/10 inch is accounted for by the fact of the great increase in diameter of the maternal abdomen. This causes the heads to be unavoidably further from the photographic film and therefore projected larger.

In conclusion, it was estimated on general skiagraphic appearances that the duration of pregnancy at the date of the photograph reproduced (September 18th) was thirty-four weeks. The further rather hazardous opinion was made, and committed to paper, that the foetuses were all boys. On October 13th quadruplets were delivered, all boys, as recorded by Dr. Constantine in her clinical account of this case.

A CASE OF QUADRUPLETS

BY

M. C. E. CONSTANTINE, M.D.

(From the Gynaecological and Obstetrical Unit of the Royal Free Hospital)

As a quadruplet pregnancy is a comparatively rare event it was felt that a short account of the recent case at the Royal Free Hospital might be of some interest. Diddle and Burford,[1] collecting figures from the literature, recently gave the incidence of quadruplet labour as 1 in 654,455, from a total of 219,899,446 recorded births.

Case Record

History.—The patient, aged 34, had had three previous normal pregnancies and labours. The children are girls, 6, 4, and 2 years old respectively. There was no history of multiple pregnancy in the father's family for three generations. The wife, one of eleven children, was herself a twin, her twin brother having died in infancy. Her mother, one of three children, had had twin sisters, who died as infants. One of the patient's brothers had twin sons living, in addition to five other children. This family history is in keeping with the general opinion that the mother has more influence in producing multiple pregnancies, though cases such as those recorded by Tarnier,[2] Gartier,[2] Strassman,[2] and Peifer[3] suggest a paternal influence also. There is some doubt when this pregnancy began. The last normal menstrual period lasted from about December 27th, 1934, to January 1st, 1935, but for seven days at the end of February there was an excessive loss, which the patient thought to be a miscarriage, as clots were passed. After this no further haemorrhage occurred. The small size of the infants, their general appearance, measurements, and muscular inertia suggest several weeks' prematurity, but radioscopic examination of the first two infants after death showed a degree of ossification approaching maturity. Mr. Ulysses Williams reports on these findings in the preceding article.

Examination.—The patient first attended the district antenatal clinic on August 20th, when the abnormal size of the uterus suggested a multiple pregnancy. *X*-ray examination to confirm this showed four foetuses. The only other abnormality noted at this time was moderate oedema of feet and legs, the urine and blood pressure being normal. The oedema and general discomfort increased, and on September 5th the patient was admitted for rest and observation. There was no evidence of toxaemia, and, apart from pressure symptoms, the pregnancy continued normally until labour began on October 10th. Her girth on this date was 45¾ inches, and a head was palpable just above the pelvic brim.

Labour.—At 2.30 p.m. on October 10th there was a sudden discharge of blood-stained liquor, but pains did not begin until four hours later. The contractions were very irregular and slight for the next twenty-four hours, and at the end of this time the os was found to be two fingers dilated, with the first head in the pelvic cavity. Soon after this there was a further discharge of clear liquor, probably from rupture of a second bag of membranes. It was only about midday on October 12th that the contractions became regular and forceful. At 6 p.m. a second vaginal examination was made, and the cervix now found to be dilated except for a small posterior rim and an anterior lip, the head still in the oblique diameter. In spite of strong and frequent pains no further advance was made, and four hours later it was decided to deliver the first child while the uterus was still acting well.

Delivery.—After rotating the head an extremely easy forceps delivery was effected at 10.25 p.m. Contractions recommenced

almost immediately, and at 10.50 p.m. the second foetus was found to be presenting as a vertex with the membranes already ruptured. The infant was delivered by lifting the very small head over the perineum. Strong contractions continued, and at 11.5 p.m. a further examination was made. The presenting bag of membranes was ruptured artificially, and with some slight difficulty the third child was delivered as a breech. The difficulty was due to the fact that the arm and shoulder of the fourth foetus were also engaging in the pelvic brim, and had to be displaced upwards. At 11.15 p.m., as pains were recurring, the fourth bag of membranes was ruptured artificially, the transverse lie of the foetus corrected by internal version, and extraction as a breech performed. At 11.40 p.m. a placental mass with three cords attached was expelled and five minutes later the remaining placenta. Haemorrhage was not excessive.

The After-birth.—The first placental mass weighed 2 lb. 9 oz. and was found to consist of two placentae joined by their contiguous margins. One of these two placentae was that of the first two infants, and had one chorionic and two amniotic sacs. The attached placenta was that of the fourth child with a distinct chorion and amnion. The placenta expelled separately was that of the third child, and chorion and amnion were complete.

The Infants.—These were all males, without external abnormality, and weighed 3 lb. 7½ oz., 2 lb. 1½ oz., 3 lb. 8½ oz., and 3 lb. 10 oz. twelve hours after birth. The first-born died when three days old; post-mortem examination showed atelectasis of the bases of both lungs and a widely patent foramen ovale. The very small second child died on the sixth day and atelectasis alone was found. The mother's puerperium has been uneventful.

Discussion

It would appear, from a consideration of the placental masses, that three ova were fertilized, and the first two infants were bi-amniotic twins from one ovum. These placental findings resemble those in a case of quadruplets reported by Frankel. Lantuéjoul and Reglade[4] described quadruplets with mono-amniotic twins and two other separate placentae. Whitridge Williams[5] reported a case with four distinct chorionic sacs. In Lloyd's[6] case there was one placenta to three of the infants, with the fourth distinct, and a similar condition is reported by Loudon.[7] Diddle and Burford[1] have described quadruplets consisting of two sets of identical twins, and a case of mono-chorionic quadruplets is described by Panizza.[2] Thus it seems that one, two, three, or four ova may be involved in the production of a quadruple pregnancy.

I am indebted to Professor Fleming, director of the obstetrical and gynaecological unit of the Royal Free Hospital, for permission to publish this case.

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THE EYNESBURY QUADRUPLETS

BY

E. H. HARRISSON, M.D.

A brief account of the delivery of the Eynesbury quadruplets may interest readers, although there was no difficulty to be overcome and no extraordinary procedure had to be used.

The Delivery

At 1.30 a.m. on Thursday, November 28th, I was called to Mrs. Walter Miles, the messenger saying that she was losing a lot of water. I went at once, and on examination found the membranes had ruptured, the os was very soft and dilated to two inches, a vertex L.O.A. presented. The patient had felt no pains before my visit. The uterine contractions became painful and stronger about 2.45 a.m., and a female child was born easily at 3.18 a.m. The pulsations in the cord continued for about twenty minutes, and I ligatured and severed the cord. Uterine contractions ceased until 3.25 a.m., when they began again strongly. A second bag of membranes presented, which I ruptured, and a second child—a male—was born easily at 3.47 a.m., also L.O.A. The cord pulsated for about ten minutes, and I ligatured and severed it. The uterine contractions ceased until about 4.55 a.m. The third bag of membranes could be felt high up in right horn of uterus, and was ruptured with difficulty at 5 a.m. A foot appeared immediately, and I delivered the third child—a male—breech presentation, at 5.6 a.m. The cord pulsated for ten minutes, and was ligatured and severed. The placental end immediately disappeared into the vagina.

The Fourth Child

The uterine contractions were strong all the time after the birth of the third child, and occurred at intervals of about four minutes. I could not reach the fourth bag of membranes with my finger, and therefore inserted my hand into the uterus after administering chloroform, which had been withheld until after the birth of the third child. I ruptured the membranes and delivered the fourth child—a male—breech presentation, at 5.44 a.m. This delivery was very rapid, but the child must have "pre-breathed," because it made no spontaneous effort and the pulsation in the cord could only just be felt (about 20 per minute). I immediately ligatured and severed the cord and began artificial respiration by Schäfer's method. In a short time some amniotic fluid began to escape from the nose and mouth, and it was not till twenty minutes had elapsed that it made its first gasp. This, however, ceased, and artificial respiration was continued for half an hour, at the end of which time the child began to breathe freely and cry feebly. I then handed the child to the nurse and took charge of the mother.

There was no haemorrhage at all until the fourth child had been born, when the mother began to lose slightly more than normal. I scrubbed up again, and as the placenta did not express easily I removed it by hand. I injected pituitrin at once, and when the patient was sufficiently conscious I gave her cotarnine by mouth. The uterus contracted well and remained retracted; haemorrhage became normal, and she is making an uneventful recovery. The placenta is interesting, and has been carefully examined. It is now preserved, and can be seen in the museum at Bedford County Hospital.

Welfare of the Infants

The children were kept in a warmed room at 70° F. and fed on sterilized water only for forty-eight hours, when bottle-feeding with human milk began. Their weights at birth were, approximately, in order of birth:

Sex	At Birth (Nov. 28th)	Nov. 30th	Dec. 3rd	Dec. 8th	Dec. 16th
F.	3 lb. 12¼ oz.	3 lb. 8 oz.	3 lb. 4¼ oz.	3 lb. 7¼ oz.	3 lb. 13 oz.
M.	3 lb. 15 oz.	3 lb. 10 oz.	3 lb. 7½ oz.	3 lb. 9½ oz.	4 lb. 1¼ oz.
M.	3 lb. 7 oz.	3 lb. 3 oz.	3 lb. 2¾ oz.	3 lb. 3½ oz.	3 lb. 10½ oz.
M.	2 lb. 13 oz.	2 lb. 7½ oz.	2 lb. 7¼ oz.	2 lb. 10½ oz.	2 lb. 15½ oz.

They are now gaining steadily in weight each day—between half an ounce and one ounce each. On December 8th Ann took 8 oz., Ernest 8¾ oz., Paul 9 oz., and Michael 7½ oz. of undiluted human milk.

Conditions were impossible in the cottage where they were born, and so I removed them to my house on Saturday, November 30th, where they could be better cared for and better protected from the public. I am grateful to Dr. Donald Paterson for the valuable help he has given me, and to the Management Committee of Great Ormond Street Hospital for Children for supplying four nurses gratis during the time of emergency. This act of generosity is all the more appreciated when I know they can ill afford it, having to make a great effort on their own behalf for funds for rebuilding.

The Ante-natal Notes

The first day of the last menstrual period was April 15th, 1935. *X*-ray examination in September showed three babies—two vertex and one breech. There was no albuminuria and the bowels opened regularly.

Mrs. Miles is 33 years of age. This is her second pregnancy. The first child is a boy—1 year and 10 months old. Before pregnancy she measured twenty-four inches round the waist ; just before her confinement the maximum measurement was fifty-four inches. Her height is five feet five inches.

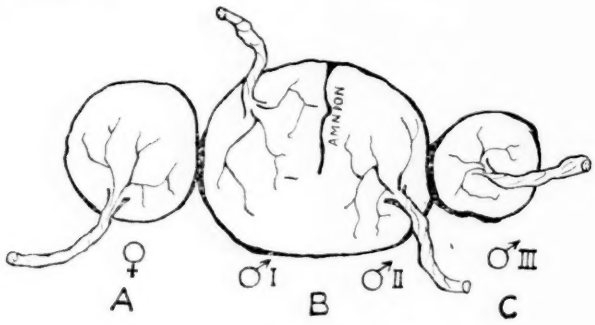

Diagram of placentae.

Note by Mr. Gifford Nash

The quadruplets originated from three ova, as is evident from the above diagram, which shows a large central twin placenta with smaller placentae attached to it. There were no vessels whatsoever connecting placentae A and B or placentae B and C. The central large placenta was symmetrical and showed no division ; there were two distinct amniotic sacs, but the partition was absent in nearly half the diameter of the placenta.

Clinical Memoranda

Intravenous Pituitrin in Post-operative Ileus

There is no more important post-operative event than the first action of the bowels. The surgeon can face other complications with justifiable confidence, but should constipation persist and bring in its train the unhappy sequence of progressive abdominal distension, exhaustion, and vomiting with all its evil consequences, then too often, in spite of every effort, the patient succumbs. "If the bowels are open then she will get better," was the pithy dictum of one of my old teachers while doing a certain colectomy.

There are all grades in this post-operative sluggishness of intestinal activity, and correspondingly wide is the array of highly vaunted therapeutic measures, each no doubt effective in its place. It is not my wish to discuss the relative merits of the multitude of available purgatives, of enemata, of a well-timed hypodermic injection of pituitrin, eserine, or acetylcholine, or of spinal anaesthesia. All these have proved efficacious in different cases, but in the severe type known as paralytic ileus purgatives seem only to initiate or increase vomiting, while the most varied enemata of treacle, turpentine, vomited bile, or hypertonic saline give no relief.

Technique and Dosage

In the following case reports I should like to draw attention to the extreme value of pituitrin given intravenously. In each one it will be seen that post-operative constipation and distension were severe and defied all ordinary measures, but that a timely dose of this drug by the intravenous route produced immediate and satisfactory results and the grave crisis was averted. The dosage used was 0.5 to 1 c.cm. of standardized posterior lobe extract, and this was given into the median antecubital vein very slowly—0.1 c.cm. every five seconds—due watch being kept for untoward effects on the general condition. In every case the result was dramatically sudden, the free evacuation of flatus and fluid faeces occurring before the plunger of the syringe was fully driven home. There was usually a little pallor and sweating at the time, but later the injection was regularly followed by a tranquil sleep from which the patient awoke much refreshed. In no instance was a repetition of the injection necessary, good response being given to milder measures subsequently.

As the injection is made very slowly one can be guided by the patient's own sensations. Untoward reactions would be heralded by excessive distress, pallor, sweating, and collapse. Brandy and coramine were always at hand during the injections, but it was never necessary to use them.

Case Reports

We have now collected six cases of severe post-operative paralytic ileus successfully treated in this way. The results in the following three cases are typical of those obtained.

Case 1.—On March 22nd, 1935, the patient, aged 53, underwent laparotomy and drainage for rupture of the uterus due to carcinoma ; there was also general peritonitis. On April 3rd complete hysterectomy was performed ; the field was an infected one, and many plastic peritoneal adhesions had formed. Thirty-six hours after operation two ounces of ol. ricini were given without effect. Twelve hours later the patient complained of much discomfort and the abdomen was moderately distended. Hypodermic eserine and pituitrin (1/50 grain and 1 c.cm. respectively) were then given, and were followed after half an hour by a turpentine enema, which was later returned clear, unaccompanied by flatus, although a rectal tube was left in. Sixty-four hours after operation the abdomen was very distended and the patient showed the early signs of exhaustion. The pulse rate had risen from 100 after operation to 120. Pituitrin was given intravenously ; after 0.7 c.cm. the bowels were very freely open, the patient slept, and the pulse fell to 96 at the end of twelve hours. She was discharged well on April 18th.

Case 2.—In this case routine total hysterectomy by the abdominal route for fibroid uterus was performed on February 20th, 1935. On the sixth day a condition of "burst abdomen" was discovered, and at operation several adherent coils of small intestine, partly covered with flakes of lymph, had to be replaced inside the abdomen. On March 2nd, four days after the second operation, there was abdominal distension and persistent constipation despite ol. ricini, two ounces, forty-eight hours after operation, and a turpentine enema preceded by pituitrin 0.5 c.cm. hypodermically, sixty hours after operation. Two further hypodermic injections of 1 c.cm. pituitrin being unsuccessful, 1/2 c.cm. was given intravenously, again with instantaneous relief. The patient was discharged cured on March 19th.

Case 3.—The patient, aged 64, underwent laparotomy and drainage for acute appendicitis with peritonitis on April 15th, 1935. Two days later the abdomen was very distended and paralytic ileus was diagnosed. There was failure to react to two turpentine enemata, and ol. ricini, given by the mouth, was vomited. Hypodermic injection of acetylcholine 0.1 gram was given four-hourly for six doses without effect, so that seventy-two hours after operation it was decided to try pituitrin intravenously. Again a good immediate result was obtained.

These three examples typify our experience in such cases. Indeed, it would appear that pituitrin, given intravenously, reaches the smooth intestinal muscle in such concentration as to cause the latter's vigorous contraction whatever insults have been offered it in the way of septic mischief or operative intervention.

My thanks are due to Mr. Green-Armytage and Mr. Grant Batchelor for permission to publish these case reports.

F. F. RUNDLE, M.B., B.S.,
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Reviews

FRACTURES AND DISLOCATIONS

The new edition of Dr. KELLOGG SPEED'S well-known *Text-book of Fractures and Dislocations*[1] is especially welcome at the present moment, when the enormous importance of fractures in their surgical, social, and industrial aspects is at last gaining the recognition it deserves. The volume covers the whole subject with the greatest thoroughness, and may be consulted with equal advantage by the young resident who knows everything or the experienced surgeon who is more conscious of his limitations.

The first chapter is devoted to a discussion of the general methods of treating fractures, the methods of reduction, of applying extension, and of maintaining position, and contains many valuable practical hints. The operative treatment of fractures is then discussed, and a full description is given of the methods of skeletal traction, which now holds such an important place in the treatment of difficult fractures. The technical details of operative manipulations and plating are well described and illustrated. An excellent chapter on the treatment of dislocations completes the general section of the book, and special fractures and dislocations are then taken up by Dr. Kellogg Speed in detail. We would call particular attention to the very valuable chapter on fractures of the spine, the treatment of which has been revolutionized in the last few years.

The whole of the volume forms an admirable presentation of its subject, every detail of which has been most carefully considered. The half-tone illustrations are excellent, but of far greater interest are the outline drawings profusely distributed throughout the book. In the case of fractures of the humerus in the region of the elbow there are over thirty of these outline sketches, and they present to the reader the difficulties of these very important fractures with an elucidation which no written description could approach.

In textbooks from the United States we are accustomed to a high standard of presentation, but the subject-matter is not always of the same practical value. No such criticism could be made of this volume, and we are certain that all those who are interested in this important subject will read it with advantage and enjoyment.

MINOR MEDICAL MYSTERIES

Few medical men wield so deft and charming a pen as Dr. LEONARD WILLIAMS. His *Minor Maladies* has become a minor medical classic, and his *Minor Medical Mysteries*[2] is very much in the same key, though the touch is lighter. He discourses amiably on as great a diversity of things as the Walrus invited the Oysters to do ; but he would heartily condemn the subsequent greedy behaviour of both Walrus and Carpenter, for to Dr. Leonard Williams the greatest of all sins is gluttony. Tolerant towards many foibles, he is merciless to the " bald fat man of 50," only allowing him the advantage of good digestion and the virtue of good temper. In a world which he finds improving in many respects, particularly as to drinking, he regretfully " does not anticipate any diminution of gluttony." We wonder if he has retained that undergraduate habit of keeping menus as a record of pleasant occasions. If so, we think he will find almost a radical change in our habits of feeding since the war. No longer do City Companies or the High Tables of the Universities indulge in the gargantuan feasts of old. We must be forgiven for dealing with this aspect of his book at such length, for it occurs and recurs throughout ; no matter what the topic on which he embarks, out it pops like King Charles's head. But his standard is an exacting one, for he quotes with approval the octogenarian physician who said, " I take but one meal a day, and I always rise from that meal feeling that I could sit down and eat it all over again." Such asceticism is not for all! " Thinkest thou because thou art virtuous there shall be no more cakes and ale," Dr. Leonard Williams?

Among the many things in the intellectual feast of which he invites us to partake he treats of genius, of fear, of nudism, of noise, of radium, and of tobacco. Each essay is brief enough to suggest the wicked comparison of *hors-d'oeuvre*, a sinful device to provoke men to ask for more. This is an entertaining book by a physician of much individuality, who has always taken his own way through life and stuck to it. The profession owes more to the challenging originality of his thought than it is willing to admit. And the last essay, " Of Growing Old Gracefully," might well bear the subtitle " By One Who is Doing It."

SURGERY OF THE SYMPATHETIC SYSTEM

The Autonomic Nervous System[3] will be welcomed by all who are interested in the surgery of the sympathetic system and are therefore familiar with the writings of Dr. JAMES C. WHITE on this subject. His comprehensive account of the many conditions in which an attempt may be made to correct disordered function in certain organs by destroying their sympathetic nerve supply has, however, a wider appeal, and should help general practitioners to recognize the cases which are likely to respond favourably to surgery. It is written in a clear and pleasing style, and, since it starts with the fundamental principles of anatomy and physiology and a description of the special methods of clinical investigation required in cases of visceral disease, the reader is led step by step to an understanding of the application of these principles to surgical practice.

The importance of careful selection of cases for operation is emphasized, and Dr. White gives many examples of the use which can be made of novocain for producing temporary paralysis of autonomic nerves to forecast the more permanent effects of operation. The technique of the standard operations upon the sympathetic system is well described and is illustrated by drawings which, with the exception of those showing the posterior approach to the cervico-thoracic trunk, are very clear and helpful. It is interesting to note, however, that there is as yet no agreement about the ideal method of blocking sympathetic impulses to the oesophagus and to the colon, and that Dr. White has reason to suppose that in the limbs recurrence of symptoms occurs more frequently after post-ganglionic than after pre-ganglionic sections. More prolonged post-operative studies will be required, however, to establish the truth of this assumption. It is also remarkable that in a volume which includes so many references to the experience of other surgeons the work of Harris and Harris on renal sympathectomy should be passed over.

Dr. White gives full consideration to the methods of alcohol injection as an alternative to ganglionectomy, but is careful to point out that a troublesome neuritis may result from damage to the adjacent spinal nerves. It is evident that his experience of sympathectomy in the treat-

[1] *A Text-Book of Fractures and Dislocations: Covering Their Pathology, Diagnosis and Treatment.* By Kellogg Speed, S.B., M.D., F.A.C.S. Third edition, thoroughly revised. London: H. Kimpton. 1935. (Pp. 1,000 ; 1,042 figures. 50s. net.)

[2] *Minor Medical Mysteries.* By Leonard Williams, M.D. London: Cassell and Co., Ltd. 1935. (Pp. 211. 5s. net.)

[3] *The Autonomic Nervous System. Anatomy, Physiology, and Surgical Treatment.* By James C. White, M.D. London: H. Kimpton. 1935. (Pp. 386 ; 96 figures. 30s. net.)

ment of asthma, epilepsy, and disorders of the bladder has been unfavourable, and that in thrombo-angiitis obliterans he has not met with the success claimed by other surgeons. With his colleague Dr. R. H. Smithwick, however, he has devised a method of achieving a peripheral sympathectomy by crushing mixed nerves in the leg which is likely to prove of considerable value in the treatment of this distressing malady.

LIFE IN THE COUNTRY

Go to the Country[4] is Dr. PHILIP GOSSE's advice to those about to retire. No book could be more cheering for the middle-aged or elderly, for the author stoutly maintains that the period of retirement, or, as he prefers to call it, of emancipation, is the happiest and most important in life. Deprecating the case of the man of 60 who mournfully awaits his end, solaced only by golf and bridge, he cites examples of the achievements of advanced age. Anthony Trollope's mother wrote her first book at 50, completing her hundred and fourteenth at 76, while Titian is said to have painted the "Battle of Lepanto" at 98. The main theme of Dr. Gosse's book is his own life in the country, but he does not hesitate to wander along any bypath whither association of thought may lead him. In this way he touches upon old herbals, the bibliography of piracy (on which he is an authority), the preservation of ancient buildings, and a host of other topics. The reader is gradually more and more attracted, not merely by the book, but by the character of the author as this is unfolded before him.

In Dr. Gosse's charmingly unorthodox personality two traits stand out—love of the beautiful and love of animals. No creature is too humble to become his pet. He has imported crickets to chirp on his hearth and edible frogs to croak by his pond: he is an almost passionate friend and admirer of the toad. Naturally, he is a bird lover. During his early days of country practice the drumming of a greater spotted woodpecker near the open window lured him instantly from the bedside of a wealthy hypochondriac. He was indignantly dismissed, but, as he philosophically remarks, guineas vanish, while the memory of beauty remains. In style and construction this book recalls to the reviewer's mind the work of Axel Munthe. It is a book to read and a book to keep.

TWO OXFORD PHYSIOLOGISTS

Professor Francis Gotch drew attention in 1908 to Richard Lower and John Mayow, two distinguished members of the Royal Society whose work was receding into obscurity. Much has since been written about them, and their names are now inseparably connected. Lower made important experiments upon the heart and carried out blood transfusion crudely but successfully. Mayow stated that "there is something in the Air absolutely necessary to life which, whatever it be, being exhausted the rest of the Air is made useless and no more fit for Respiration." He wrote, too, on rickets. Professor JOHN FULTON of Yale has recently issued a paper read before the Oxford Bibliographical Society which he dedicates to Sir Charles Sherrington, Gotch's successor in the Waynflete Chair at Oxford and a former President of the Royal Society. The pamphlet of 62 quarto pages is entitled *A Bibliography of Two Oxford Physiologists*.[5] It is, however, much more than a mere bibliography of the writings of Lower and of Mayow. Dr. K. J. Franklin, who has translated very admirably Lower's treatise *De Motu Cordis*, supplies an introduction to Lower's experimental studies on the heart; Professor Fulton himself writes on Mayow with a full knowledge of what he did and where he stood in relation to his great contemporaries, Boyle, Hooke, and Swammerdam. The result is interesting, and in the case of Mayow somewhat depressing. Lower becomes a greater figure than before; John Mayow degrades a little, but he was only 25 when the *Tractatus Duo* appeared in 1668, and he was full of youthful enthusiasm. Professor Fulton regards the book as one would the graduation thesis of a rather brilliant student. It is sad to think of him as a fallen idol, but there is perhaps still some hope for him. Professor Fulton warns his readers that

> the errors into which nearly every commentator on Mayow has fallen have been as grievous and seemingly as inevitable as those into which students of Servetus have strayed. "Touch Servetus and be burned" are appropriate words of caution for anyone who would approach the author of *Christianismi Restitutio* without knowledge of bibliography; and he who would touch Mayow without first protecting himself with well-constructed bibliographical armour of seventeenth century science (and textual gas-mask) will be suffocated by "spiritus nitro-aereus" long before he is made aware of impending danger.

Of the *Bibliography* as a bibliography it is sufficient to say that it is as attractive and as exhaustive as those of Boyle and Fracastoro which Professor Fulton has recently published.

SILICOSIS LITERATURE

The importance of silicosis from the legal as well as from the medical point of view will be admitted by all, and is emphasized in the foreword by E. R. LeCount to *The Pneumonokonioses [Silicosis] Literature and Laws of 1934*, by GEORGE G. DAVIS, ELLA M. SALMONSEN, and JOSEPH L. EARLYWINE (Chicago Medical Press). "It is estimated," he says, "that at this time, March, 1934, there are suits in the United States for injury and death which it is claimed resulted from inhaled silica amounting altogether to at least three hundred million dollars." This work is arranged in two parts. Part I consists of international abstracts and reviews dealing with the subject and published in 1934. Part II deals with laws. There is a good index of authors, and there is also a subject index. The latter suffers from a defect common to all subject indexes: that it is very hard to arrange papers under completely satisfactory headings from the point of view of their contents. Some authors are so fortunate as to have their names both in the authors' index and in the subject index. For instance, Dr. W. R. Jones appears not only as an author but also as a "subject" under the heading of "Jones Sericite Theory," and is referred to in eighteen summaries for the year.

The summaries themselves are in many cases excellent, but a reviewer must be pardoned for not attempting to read them all. Good as some are, they cannot all be good substitutes for the papers themselves, which are well known in the original to all specialists interested in this subject. It may help, however, to separate the wheat from the chaff, as it is easy to see in the summaries that many of the papers are quite unimportant, and might conveniently be avoided by persons desiring to inform themselves on the subject of silicosis. The more valuable papers receive considerable attention, and every effort is made to do them justice. When it comes to Part II the defects of summary are still more apparent. One opens at random and finds silicosis rather swamped by notices of a number of other industrial diseases. For instance, "*Minnesota*: Decisions. Chronic benzol poisoning suffered by employee spreading rubber cement on tape"; "*Colorado*: Decisions. Osteomyelitis of dishwasher's

[4] *Go to the Country*. By Philip Gosse. London: Cassell and Co., Ltd. 1935. (Pp. 282. 8s. 6d. net.)

[5] *A Bibliography of Two Oxford Physiologists. Richard Lower, 1631–1691; John Mayow, 1643–1679*. By John F. Fulton, M.A. Oxford: John Johnson, University Press. 1935.

wrist-bone preceded by soreness in palm of hand with which metal scraper was used," and so on. The best summary of legal enactments will be found under "O" in the subject index, as "occupational disease compensation" is treated of under the various countries concerned. Turning to compensation for occupational disease in Great Britain, however, there are only three references: one a brief notice of a paper in the *Lancet*; another touching on the Workmen's Compensation Acts, 1925–34; and a third dealing with a report of a committee on pneumonoconiosis of the American Public Health Association, which apparently touches on arrangements in Great Britain, but is really about American claims for compensation.

The book should be of service to those in need of handy references to the literature; but serious workers would do well to consult the original papers also.

Notes on Books

The seventeenth edition of *Dorland's Medical Dictionary*[6] has been brought up to date by the addition of several thousand new terms. This voluminous work now extends to nearly sixteen hundred pages—more than double the number in the original edition. For every term the correct pronunciation is given phonetically, followed by the derivation and a concise definition. In the case of Greek derivations, which form a large proportion, the Greek lettering is used: a key to the Greek alphabet is provided for the assistance of the increasing number of practitioners unfamiliar with that language. Classical purists will deplore the number of hybrid words invading the nomenclature of modern medicine. The dictionary contains a profusion of practical illustrations in the text, and the range of small portraits is wide enough to require a special index. In addition, there are a number of full-page plates, several of which are excellently reproduced in colour.

In an interesting monograph on the relation of anaemias to nutrition (Madrid, Ediciones del Arbol, 12 pesetas) Dr. J. S. RODRIGUEZ has correlated the anti-anaemic factor in the liver with substances taken in with the food—vitamins, amino-acids, iron, and copper. After a discussion of the metabolism of the constituents of haemoglobin, the author proceeds to a classification of the various forms of anaemia. He is impressed by the relationship of anaemia to vitamin lack, and believes that pernicious anaemia is due to an alteration of the formation of red blood cells owing to a lack or abnormal state of the anti-anaemic factor. Active liver extract apparently does not contain iron or copper or the haemopoietic amino-acids. Water-soluble vitamin B_2 is also absent. The author of *Anemias y Alimentacion* believes that the anti-anaemic factor is a special vitamin which is built up in the gastric mucous membrane. A great deal of experimental work is quoted, and the literature on the subject has been exhaustively searched.

A long review of the original French edition of Dr. RENÉ SAND'S *Health and Human Progress*[7] appeared in these columns on October 20th, 1934. We then expressed the opinion that *L'Economie Humaine par la Médecine Sociale* was a book of great originality and importance, which called urgently for an English translation. This has now been excellently done by Dr. C. F. Marshall from the latest revision of the French edition, and appears under the title we adopted for our review. It is therefore now available for the wide English-speaking circle which should be attracted by its trenchant analysis of present medico-social conditions, its enthusiasm for the part to be played in the future by the medical profession, and its wealth of information derived from many countries and not least from this. The thesis of the book may be summed up in the quotation from Bergson, "Man hardly realizes that he can shape his own destiny," and from Dr. Sand's statement, amply supported by facts and statistics, that human life, health, and happiness "can be bought." We have no hesitation in again recommending the book as a source of inspiration and information to everyone interested in social work and human progress, and not least to the members of a profession whose responsibilities for the future of the race have as deeply impressed the author as they must do his readers. There is a very full bibliography and a good index.

In *Reminiscences*[8] Dame AGNES HUNT tells the story of a life devoted to cripples. It is an epic of tenacity and pluck, for Dame Agnes was herself crippled at an early age, and her life was heavily handicapped by constant ill-health. She describes with racy humour her childhood in Shropshire, followed by wanderings in Queensland and Tasmania. On her return she determined to train as a nurse, becoming a pupil at the Royal Alexandra Hospital, Rhyl, where she learned the primary foundations of the treatment of chronic cases—fresh air and happiness. Her nursing experiences included a smallpox epidemic in Middlesbrough and a severe outbreak of typhoid in a small town in the Midlands. In 1900 she returned to her native county to start a convalescent home for the Salop Infirmary. There was no money: practically everything had to be improvised. Yet from the first the home exerted a magnetic attraction for cripples. Three years later the author was forced to consult Sir Robert Jones about her own disability. He operated successfully; friendship and mutual admiration sprang up; the great orthopaedist became interested in the home. As a result of their happy collaboration the humble convalescent home blossomed into an orthopaedic hospital of 300 beds, with a staff of after-care nurses, clinics covering eight counties, and a training college for cripples.

Mr. MACLEOD YEARSLEY, under the title *Le Roy est Mort* (Unicorn Press, 3s. 6d.), gives an account of the deaths of the rulers of England from William the Conqueror to King Edward VII. He includes in his list Lady Jane Grey and Oliver and Richard Cromwell. The task has been attempted on several occasions, but never with very satisfactory results. The early records do not give sufficient details, the medical terms in use at the time are difficult to interprete, and the historian is often prejudiced. Mr. Macleod Yearsley has made the best of a bad job, but he has too often relied on printed accounts instead of going to original sources. He is particularly hard upon Henry VIII and his children, for, with the exception of Elizabeth, he believes them all to have been syphilitic. He should have consulted Mr. Frederick Chamberlin's book, published in 1932, which might have led him to modify his opinion. Mr. Yearsley suggests that William the Conqueror died of a ruptured bladder, Henry I of ptomaine poisoning, Stephen of appendicitis, and Richard II of voluntary starvation associated with anorexia nervosa. We may not agree with his diagnosis in every case, but the book gives evidence of research and thought, and is to be recommended as a starting-point for still further research

The Control of the Breath: An Elementary Manual for Singers and Speakers, of which a second edition is now published (H. Milford, Oxford University Press, 6s. net), is an attempt to place voice production upon a scientific basis. To this end Mr. GEORGE DODDS, a graduate in music, collaborates with Dr. J. D. LICKLEY, an anatomist. The authors contend that students of singing and elocution, in order to achieve the best results, should have some knowledge of the anatomy and physiology of the respiratory and vocal organs. The book is divided into two parts: the first devoted to a description of structure and mechanism, the second to practical exercises.

[6] Philadelphia and London: W. B. Saunders Company. 1935. (30s. net plain; 32s. 6d. net with thumb index, flexible or stiff binding.)

[7] *Health and Human Progress. An Essay in Sociological Medicine.* By René Sand. Translated from the author's revised French text by C. F. Marshall, M.D., F.R.C.S. London: Kegan, Paul and Co., Ltd. 1935. (Pp. 278. 10s. 6d. net.)

[8] *Reminiscences.* By Agnes Hunt, D.B.E., R.R.C. Shrewsbury: Wilding and Son, Ltd. 1935. (Pp. 137; illustrated. 5s. net, postage 6d.)

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EXAMINATIONS

"The examination system has grown to be an important element not only in our education but in the whole social system of our country. . . . The part played by chance in the verdicts given at different examinations on which careers depend must often at the present moment be a great one." These two sentences taken together indicate a position which must be regarded as disquieting, if not distressing or even disastrous. They are quoted from the preface to a pamphlet entitled "An Examination of Examinations," summarizing investigations, conducted under the auspices of an international conference on examinations, by an English committee of which Sir Michael Sadler was the chairman, Sir Philip Hartog the director, and Dr. E. C. Rhodes the statistician.[1] These investigations were made most carefully under conditions approximating as closely as possible to those of actual examinations for special places in secondary or central schools, for the general school certificate, for a college scholarship in English essay at one of the older universities, and for university honours in mathematics and in history. The actual scripts in large enough number from these examinations were secured. The examiners were eminent and experienced, were paid fees not less than those customarily given, and were allowed ample time for their work. The marks given or classification arrived at by boards of examiners as well as by individual examiners were noted, and the placing of candidates after a viva voce examination of a general character to test alertness and intelligence was also considered. There can be little doubt, therefore, that the results may be taken as reliable and representative, and that some general conclusions can properly be drawn. These results and conclusions are set out in the pamphlet.

Broadly, and in all cases, the investigations show a relatively wide deviation in marking by different examiners and a formidable irregularity of judgement. "It was found that when fourteen experienced examiners re-marked independently fifteen scripts which had all received the same moderate mark from the examining body by which they were furnished, these examiners between them allotted over forty different marks to the several scripts. It was found, further, that when these examiners re-marked once more the same scripts after intervals of from twelve to nineteen months, they changed their minds as to the verdict of Pass, Fail, and Credit in ninety-two cases out of the total of 210. The employment of boards of examiners does not remove the element of chance. Boards, as well as individuals, may disagree in their verdicts." Particular results appear to indicate, further, that variations in the marking of English papers are somewhat greater than those of arithmetic papers; that, in assessing essays, judgement from impressions is less high and more varied than that arrived at by marking different elements in detail, and that where choice of subject is given "the fate of a candidate is partly dependent upon the particular examiner's reaction to the subject of the essay." When two Boards conducted a viva voce test there were no cases of complete agreement; the candidate placed first by Board I being placed thirteenth by Board II, and the candidate placed first by Board II being placed eleventh by Board I. With regard to this oral examination it is said "we might almost suppose different candidates to have been examined," though the interviews were conducted by equally efficient examiners under the same detailed rules. Sir Philip Hartog adds in a note: "I came to the conclusion that while the two Boards were equally skilful in cross-examining in such a way as to reveal the weaknesses of candidates, it was largely a matter of chance whether they struck on a topic in which a candidate felt so strongly that he was able to display his individuality." These various discrepancies are attributed to two causes: constant differences in the standard of marking, and the presence of an element of random marking on the part of examiners.

The seriousness of all this needs no emphasis. The element of chance in examinations is not slight but exists in a dangerous degree. There can be no confidence in tests of this kind. The career of individual candidates may be marred by an accident. Their fate may be determined not by their merit but by the particular examiner who happens to assess it. On the other hand, the modern tendency for commercial or industrial employers to demand examination certificates as evidence of ability or efficiency may result in the acceptance of candidates for employment who would otherwise be rejected, apart from its unfairness to those otherwise good pupils who do not shine as examinees. Nevertheless, the members of the committee do not propose that examinations should be abolished, and are of opinion that even the traditional essay examination should be preserved. They suggest that the system should be submitted to careful and systematic experiment. It would appear that in order to minimize the disadvantages now fully realized it might be well to duplicate the tests with different examiners and pool the results, to allow sufficient time for the examiner to be deliberate in his judgement yet not so long as to permit of a complete change of standards, to insist upon the strict observance of carefully considered rules or conditions, to strengthen the authority of the chief examiner of a team, and, in addition, to attach a greater proportionate importance to a review of the student's whole scholastic career than is at present common. It may be remembered that among the recommendations of the General Medical Council in

[1] *An Examination of Examinations.* By Sir Philip Hartog and E. C. Rhodes, D.Sc. London: Macmillan and Co. Ltd. (1s., by post 1s. 2d.)

regard to professional examinations there is one which runs: "In the regulations for the several examinations it should be provided that examiners, in assessing marks, be empowered to take into account the duly attested records of the work done by the candidate throughout his course of study in the subject of the examination." No one seems to know whether this power is often conferred or exercised, but the report of the Medical Education Committee of the British Medical Association drew particular attention to it, and asked that practical effect should be given to it.

MUCOUS-GLAND AND SALIVARY-GLAND TUMOURS

Of the many eminent services rendered by Stockholm Radiumhemmet to scientific radiotherapy, probably none is more widely appreciated than the issue of that series of scholarly monographs which appears from time to time as "Supplementa" to the *Acta Radiologica*. The twenty-third of these, on Mucous- and Salivary-Gland Tumours,[1] is by Dr. Hugo Ahlbom, and fully maintains the standard of its predecessors. This clinical study, based upon pathology and anatomy, contains an analysis of the material accumulated at Radiumhemmet over twenty-five years, and six years of continuous work were needed for its preparation. It deals not only with the familiar tumours of such glands as the parotid, but includes also those much rarer similar tumours which occur in connexion with mucous membranes supplied with serous, sero-mucous, and mucous glands. In his preface Dr. Ahlbom once more stresses the imperative need for collaboration between the clinical and the more purely scientific sides of radiotherapeutic centres, which alone has enabled the Stockholm Institute to carry out its excellent work. In Sweden centralization of treatment has been possible owing to the comparatively small population, but also in no less degree to the whole-hearted co-operation given by members of the medical profession generally. In this country, with its differing conditions and enormous population, such a centralized unit is both impossible and undesirable; but it is both desirable and possible to concentrate radiation therapy at certain well-equipped and well-staffed centres, an ideal at which the Medical Research Council and the Radium Commission have been aiming for many years.

Dr. Ahlbom opens with a historical review of the subject, then proceeds to an account of the special characteristics of the tumours under consideration, which is followed by a classification under their various histological types. Under the title of "The Material at Radiumhemmet" are included details of 254 cases which have been treated from the opening of the clinic in 1909 until the end of 1932; the author has had the opportunity of examining and taking part in the treatment of about 190 of these cases. The methods of treatment included the use of massive radium radiation by Sievert's 3-gram unit and by Lysholm's apparatus, of which the content varies between 0.5 and 3 grams of radium element. According to Radiumhemmet statistics, definitely malignant mucous- and salivary-gland tumours occur about equally in men and women; the benign and semi-malignant types, however, occur more frequently in women (65 per cent.) than in men (35 per cent.). Taking the same series of statistics, the average age on admission was 43 for the benign and semi-malignant growths, as contrasted with 52 for the definitely malignant types.

The urgent need of early treatment is emphasized for this as for all other types of malignant disease. Dr. Ahlbom considers that all mucous- and salivary-gland tumours should be treated, except when there is impairment of the general health to such an extent as to render any hope of success impossible, and also where there are widespread visceral metastases. Very old patients with completely benign tumours may also legitimately be left alone. As regards prognosis, this is remarkably good for benign tumours, and nearly as good for semi-malignant growths. This is a very important fact, because Dr. Ahlbom considers the semi-malignant tumours in many cases represent merely the early stages of malignant types. For the malignant growths, 25 per cent. were reported as completely healed and free from growth after five years. With earlier diagnosis the author hopes that these results may be improved. There is a full discussion of the various methods of treatment, including ordinary surgery, electro-surgery, and radiotherapy. A combination of the last two methods appears to be that most generally approved.

[1] Stockholm: P. A. Norstedt und Soner. 1935. (20 Swedish crowns.)

PAPWORTH AND PROPAGANDA

The première of a film entited "The Story of Papworth" was shown at Grosvenor House on December 10th, when the Duke of Kent presided at a luncheon given to a number of distinguished guests by the governors of Papworth Village Settlement. The film, directed by Anthony Asquith, tells the story of Henry Hawkins, a married working man who developed pulmonary tuberculosis. Hawkins (whose part is played by Gordon Harker) does his best to ignore the diagnosis, and persists with his work. When he hears that a mate of his has also contracted tuberculosis the gravity of his personal, social, and economic dilemma is brought home to him. Hawkins goes to Papworth, and progresses from ward to open-air chalet, and from chalet to cottage, where his wife and children join him, his health stabilized and his self-respect restored as a worker in one of the Settlement's workshops. (The Marchioness of Linlithgow reminded those present that in Papworth's twenty years of existence not a single child of tuberculous parents has contracted tuberculosis.) The epilogue to the film, spoken by Aubrey Smith, conveyed the welcome news that Lord Nuffield had offered £25,000 to Papworth on condition that the balance needed of £75,000 was subscribed from other sources. It is much to be hoped that this offer from such a generous benefactor to medicine and medical charities will evoke a similar gesture in others. It was announced during the lunch that Lady Houston had

sent a contribution of £5,000. Papworth needs money for its surgical hospital, for new factories, cottages, and hostels ; and a letter to the *Times* of December 13th announces the proposal to build a home there for tuberculous nurses. There can be no doubt that Papworth is carrying on a great work in lessening the spread of tuberculosis and in enabling the tuberculous patient to live, within his limitations, a full and productive life. Segregation of the infectious person is a problem which, in the campaign against tuberculosis, has been inadequately tackled so far except in settlements such as the one at Papworth, where segregation is achieved in an atmosphere in which the patient does not look upon himself as a patient so much as a member of a community working for its own existence and support. That such schemes as this have to depend upon voluntary donations and the fitful generosity of moneyed people may be something to be deplored. The constant appeals for funds for cancer research and hospitals that are falling down and the "financial dependence of voluntary hospitals upon the antics of their students" are a feature of English life that makes American and Continental visitors inclined to disbelieve the rumour that we are a wealthy country. The attitude of the public to medical institutions is rather like the mock-humorous attitude of Touchstone to Audrey—"A poor virgin, sir, an ill-favoured thing, sir, but mine own." But granted that this is our English way, and that we like it, Papworth can give points in publicity to most other organizations and institutions. The film referred to above—it was seen by the Queen at Leicester Square Theatre on December 17th—shows how an appeal should be made to the public if it is to be effective. If the medical profession wanted, for example, to introduce widespread prophylaxis against diphtheria it could take a leaf out of Papworth's book and tell a story on the films that would help to wipe out diphtheria in a few years' time. It is no good trying to persuade people of the rightness of this or that measure of health with the sweet voice of reason. It is the emotional appeal that wins the day ; reason follows humbly after. The film, with its forcible assault upon both eye and ear, is a powerful weapon of propaganda. And it could be used with effect for "putting across" to the public the idea of preventive medicine. Perhaps the Minister of Health, Sir Kingsley Wood, a master of propaganda, might enlist the help of the moving picture in his campaign for the improved health of the people.

MILK FOR SCHOOL CHILDREN

The problem of nutrition has long been placed in the forefront of the annual reports of the Chief Medical Officer to the Board of Education. As long ago as 1908 appeared the text, "A satisfactory state of nutrition in the child is the first essential to sound physical health." Since then the same principle has been repeated in many different words and has been amplified on many occasions by the observation that the feeding of school children is not, and was never meant to be, a form of poor relief, but is essential to education, for the under-nourished child cannot benefit by the education provided. Considerable anxiety was expressed a little time ago lest the children should be suffering from the industrial depression. The Board of Education issued a reassuring report, which was not everywhere accepted. This year, reports continue to be satisfactory in most areas, and the total figure for malnutrition has only increased by approximately 1 per 1,000. In London the percentage of subnormal nutrition was lower this year than ever before, and it is rare to find severe cases of malnutrition. School care committees and head teachers select children for free meals and medical officers* nominate those who are to have free milk. The allowance is usually two-thirds of a pint given in sealed bottles twice daily. The Milk Scheme introduced on October 1st, 1934, is described in the report as a red-letter day in the history of school hygiene. It caused an increase of no less than 256 per cent. of those receiving milk for payment and an increase of 110 per cent. of those receiving it free. It is interesting to note that poverty was the cause of failure to buy milk in 25 per cent. only, and that 33 per cent. disliked milk, while another 24 per cent. considered that there was sufficient nourishment at home. The teachers, however, felt that in many cases the real cause was often apathy or indifference when poverty was alleged. Other reports come from many of the large towns in the centre of England, including those in which unemployment is widespread. An increase of malnutrition is reported from Lancashire, where the percentage reached 2.19, the highest since 1924. Increases are also reported from the Isle of Ely and Lincolnshire, yet in Cumberland, where there has been long-continued distress and unemployment, there is no visible evidence of deterioration in the children's health. The Board points out that in some areas the children only seem to get one-third of a pint of milk free, whereas it appears that two-thirds is needed for satisfactory progress. A conference meeting in 1934 issued a sliding scale of requirements of school children to assist the education authority. There is a striking dissimilarity of nutrition from area to area and even from class to class, and special surveys have been made of some of these areas, notably in Tyneside, Durham, and South Wales, where the malnutrition figure is high. Attention has also been given to the nutrition of the pre-school child in these areas, and for them also the provision of extra milk is urgently recommended. Adolescents in these same areas are watched if they are attending junior instruction centres.

CYSTICERCOSIS AND EPILEPSY

Interest in cysticercosis has recently been revived because of its possible relation to epilepsy, and it is necessary to turn back and reconsider a disease which appeared to have lost its importance in medicine. There was a time when measled pork was a familiar sight at slaughterhouses, but now it is almost unknown. Similarly, human infection from the tapeworm *Taenia solium*, which results from the eating of measled pork, is now a distinct rarity. In this country it has been almost completely eradicated by meat inspection, for apart from the consumption of infected food there is no way of acquiring infection with this tapeworm. In the East, however, tapeworm is still a familiar disease, and infection not uncommonly occurs in soldiers stationed in India. *Taenia solium* may be regarded as a perfect parasite ; it gets its food without the slightest exertion. The tapeworm attaches itself by muscular suckers and

* See Circular 1443, issued by the Board of Education on December 16th.

hooks to the mucous membrane of the intestine and lies bathed in the food it absorbs. It requires no special sense organs because it is living in darkness and warmth and is secure from its enemies. Its chief occupation is prolific reproduction. The segments or proglottides grow down from the head till the worm may have as many as 800 or 900 segments and be 2 or 3 metres in length. The proglottides are passed during defaecation, usually in groups of five or six, and each proglottis may contain 30,000 to 50,000 eggs. The cystic or bladder-worm stage of tapeworms always takes place in some animal which the host eats. Thus the tapeworm of the cat passes through its bladder-worm stage in the mouse, and one of the tapeworms of the dog passes through a minute bladder-worm stage in the dog flea. For *Taenia solium* man is the exclusive host, and the bladder-worm stage is passed in the pig, giving rise to cysticercosis. Human tapeworm infection results from the consumption of meat infected with cysticerci or bladder-worm. If, on the other hand, the ova of the tapeworm should be ingested there is a danger of man becoming the intermediate host and himself suffering from cysticercosis. This may happen through the consumption of water or uncooked vegetables containing the eggs of *Taenia solium*. Or a man harbouring the adult worm may "auto-infect" himself and acquire *Cysticercus cellulosae* as a result of unclean personal habits. Such an infection is not necessarily accompanied by any symptoms. In a letter published in this week's issue (p. 1229) Major-General MacArthur remarks that the biological object of cysticerci while in the tissues of the intermediate host is to remain quiescent. He likens them graphically to "thieves who have entered some premises where they stay hidden so long as concealment is helpful to their purpose." After their death, however, as the result of the liberation of the toxic products of degeneration, serious symptoms may develop, of which the chief is epilepsy. Major-General MacArthur has repeatedly called attention in the annual report on the Health of the Army to the importance of excluding cysticercus infestation as a cause of epilepsy. His work was the stimulus to the inquiry into cysticercosis carried out by Major H. B. F. Dixon and Dr. D. W. Smithers, which was published in the *Journal of the Royal Army Medical Corps* (1935, lxiv, Nos. 4, 5, and 6; and lxv, 1 and 2). This inquiry showed that the disease cysticercosis is far from uncommon in those who have lived in countries where sanitation is defective. Unless evidence of cysticercosis is systematically sought for the diagnosis may be missed, as the subcutaneous nodules which are suggestive of the disease may be absent at the time of the examination, only to come out in crops at a later date. Radiological evidence may not be convincing for some years, as calcification does not usually take place until some four or five years after infestation. These authors point out that the ordinary descriptions of the disease are misleading in that any case may present various symptoms at different stages. If the case is followed up to the end either mental or nervous symptoms almost invariably appear. One very important conclusion to be drawn from the work of Dixon and Smithers is that "any patient previously healthy who develops fits or anomalous nervous or mental symptoms, and who has lived abroad, should be suspected of suffering from cysticercosis until proved otherwise."

REPORT OF EXPERT COMMITTEE ON NUTRITION

In the *Journal* of November 30th (p. 1053) attention was drawn to the meeting in London of the expert committee on nutrition appointed by the Health Committee of the League of Nations. The report[1] of this committee has just been published. It is recalled that the Health Organization of the League has now been engaged for ten years in the study of nutrition in relation to public health. Two conferences of experts were held (*Quarterly Bulletin*, vol. i, No. 3; vol. ii, No. 1) in 1932 to consider certain problems of nutrition. The conference in Rome went into the question of dietary standards, and drew up a scale of family co-efficients for international use. The conference in Berlin discussed physical standards and the methods of detecting states of malnutrition. In 1934 the Health Committee decided that a general report on nutrition should be made, and entrusted the preparation of it to Dr. E. Burnet and Dr. W. R. Aykroyd. In this report[2] it was stressed that in relation to health nutrition is one of the most important aspects of preventive medicine. The expert committee that met in London last month to discuss the physiological basis of nutrition expresses its agreement with the conclusion of Burnet and Aykroyd that deficiencies in important nutrients are a common feature of modern diets, and that these deficiencies usually occur in the protective foods (rich in minerals and vitamins) rather than in the energy-giving foods (proteins, fats, and carbohydrates). The first part of the report deals with the latter group, and states that 2,400 calories *net* a day are adequate for an adult man or woman living an ordinary everyday life in a temperate climate and not engaged in manual work. This allowance is to be supplemented for various grades of muscular activity. For light work it is estimated that an additional 50 calories per hour of work is needed; for moderate work, 50–100 calories; for hard work, 100–200 calories; for very hard work, 200 calories or more. For pregnant women 2,400 calories are considered sufficient, and for nursing mothers 3,000. For infants energy requirements are assessed on the basis of 100 calories per kilogram of body weight for the first three months of life; 90 calories from three to six months; 80–90 calories for six to twelve months. Further, it is suggested that the activities of girls from the age of 7 upwards and of boys from 7 to 11 years should be looked on as equivalent to light work; and those of boys from 11 to 18 years as equivalent to moderate work. As a general recommendation it is suggested that the protein intake of adults should not fall below 1 gram of protein per kilogram of body weight, and that a part of this should be from animal sources. Some animal protein is considered essential during growth, pregnancy, and lactation. In the second part of the report, on mineral and vitamin requirements, the committee states that the most important "protective" foods are milk and milk products, eggs, and glandular tissues; then come green-leaf vegetables, fruit, fat fish, and meat. It is also pointed out that "the increasing habit of large sugar consumption tends to lessen the amount of protective foods in the diet and is to be regarded with concern." In an attempt to define the quantitative needs of pro-

[1] Report on the Physiological Basis of Nutrition by the Technical Commission appointed by the Health Committee, Geneva.
[2] *Quarterly Bulletin*, 1935, iv, No. 3.

tective foods for the pregnant and nursing woman, the committee stresses the difficulty of arranging such a diet as will provide adequate calcium, phosphorus, iron, and vitamins B_1, B_2, C, and D. In this respect milk and eggs are of great service: the former rich in calcium, phosphates, and vitamin B_2 ; the latter containing vitamins A, B_1, B_2, and D, and being rich in iron. The proteins of both are of high nutritive value. It is recommended that additional vitamin D, in the form of cod-liver oil, should be given to the growing child and to the mother. It is also suggested that potatoes should replace part of the sugar and milled cereals in the diet, for they are a source of vitamin C, and yield more iron, calcium, phosphorus, and the B vitamins. On general lines the committee is of opinion that (i) variety in diet tends to safety, so long as there is a sufficiency of " protective " foods ; (ii) that lightly milled cereals and potatoes should partly replace white flour (excessive consumption of sugar is condemned) : (iii) that more milk should be taken at all ages, and that the nutritive value of skimmed and separated milk should be more widely appreciated ; (iv) that fresh fruit and vegetables should always be included in a normal mixed diet ; (v) that extra vitamin D should be provided " wherever sunshine is not abundant," and that the other vitamins are adequately provided in a diet which contains optimum amounts of protective foods. The report concludes with diet schedules for the pregnant and nursing woman, and for the infant.

HEALTH SERVICE OF SOUTH AUSTRALIA

Dr. A. R. Southwood, head of the Department of Health of South Australia, who visited Europe and North America recently in order to view the methods of health administration pursued there, now presents his results and opinions in an instructive report[1] which summarizes the essential points with exemplary correctness. He proceeds in the light of his impressions to trace the lines for further development of the health service of his own State, which, being less populous, less mature, and less completely organized than the older countries which he visited, has problems of its own. He notes, in the first place, that further progress inevitably means further expenditure, and he thinks it right that the added cost should be shared between the central Government and the local boards. An outstanding difficulty in South Australia is that the local boards are far too numerous, and the local areas far too small, for effective and economic working. This bar to progress, long recognized in this country, was removed at last in 1929 by the sweeping Local Government Act of that year, which in England abolished the multitudinous Poor Law authorities, transferring their functions to the councils of counties and county boroughs. Administrators in England will share Dr. Southwood's views on the importance of adequate training and qualifications for all health officials. He looks forward to the day when the part-time employment of health officers will be replaced by a whole-time system, and recommends for the present that adjacent local boards should combine to maintain a whole-time officer. Above all, he says, official medicine should foster the co-operation of the practising medical profession in public health work. In the medical curriculum preventive medicine now holds an important place, and the young graduate is able and willing to play his part in its practical application. Dr. Southwood approaches these problems with sympathy and understanding.

[1] Reprinted from the *Medical Journal of Australia*, April 27th, May 4th, and May 11th, 1935.

A HOSPITAL COMPENDIUM

A useful book of reference concerning hospitals and auxiliary services in the London area is the revised edition of *The Hospital Guide* for 1936.[1] Great pains have been taken to include all those small details with regard to hospitals which it is so exasperating not to know, but which more ambitious publications neglect, as, for example, the hours of attendance at the general and special hospitals of London, the charges or terms, and the means of access. Full details are also given of the sixty-seven hospitals in the metropolitan area which have pay-beds. A list of convalescent homes is given, again with charges and the procedure for admission, and other useful lists include the district nursing associations, with their addresses and telephone numbers, the centres of the National Eye Service, the addresses of the district committees in London boroughs, and the various ambulance stations. Many facts and figures are given with regard to the work of the King's Fund, and a section is devoted to the contributory scheme of the Hospital Saving Association. At the end of the little volume are a number of short articles, including one by Sir Henry Brackenbury on medical psychology, and another by the Medical Secretary of the British Medical Association on the need for protection against the worse forms of patent medicine advertising. From the same pen appears an article on the family doctor and his relation to the hospital, and the useful form designed by the British Medical Association for the convenience of practitioners in sending patients to hospital is reproduced.

INTERNATIONAL LEAGUE AGAINST EPILEPSY

At the time of the International Neurological Congress in London last summer, a meeting of those particularly interested in epilepsy was held on July 31st at the Lingfield colony. Thirty-two doctors representing fourteen countries were present. After discussion, it was unanimously decided that the International League against Epilepsy should be revived. The immediate efforts should be directed towards the improvement of the social condition and the institutional care of persons with epilepsy. To this end it was agreed that there should be a publication, issued annually or oftener, acquainting readers with facilities and with remedial efforts carried on in various countries. Plans were also laid for a meeting of the league at the time of the next Neurological Congress in Copenhagen. At an adjourned meeting held on August 2nd (with Professor A. Ley of Brussels in the chair), the following officers were elected: President, Dr. William G. Lennox, Boston, U.S.A. ; Secretaries, H. I. Schou, Dianalund, Denmark, and Dr. L. J. J. Muskens, Amsterdam, Holland ; Treasurer, Dr. Tylor Fox, Lingfield, Surrey, England. All interested in improving the condition of epileptics are invited to join the league. Membership, which includes subscription to the periodical, is the equivalent of 5s. a year, or 15s. the four-year period.

[1] *The Hospital Guide*, 1935–36. The Hospital Saving Association, 32, Lancaster Gate, W.2. (3d.)

TREATMENT IN GENERAL PRACTICE

This article is one of a series on the management of some lesions of the nervous system met with in general practice.

INJURIES FROM ELECTRICITY AND LIGHTNING

BY

MACDONALD CRITCHLEY, M.D., F.R.C.P.

An account of the treatment of electrical and lightning accidents is naturally divisible into various heads: (1) liberation of the victim from the circuit; (2) emergency treatment for shock and "apparent death"; (3) treatment of the unconsciousness; (4) treatment of the burns, fractures, and tissue necroses; and (5) management of complications.

Removal of the victim from the live installation is the first duty. The patient may be lying unconscious with some part of the body still in contact with the current-bearing wire or terminal. Or the victim may be conscious but unable to release himself from the live wire. Whether it is quicker to shut off the circuit by closing the switch than to remove the victim depends upon the circumstances. If the latter is attempted great care must be exercised by the rescuer to avoid sustaining a shock himself. No one should grasp the victim or the victim's clothes with the bare hands. Rubber gloves should be worn, or, if these are not available, the hands may be protected by wrapping many layers of cloth or paper around them. It may be simpler to push the victim away from the apparatus by means of a wooden stick or pole. Cutting the wire is a rapid method of interrupting the circuit, but is a dangerous procedure unless a heavy axe with a stout wooden shaft is used.

Artificial Respiration

As soon as the victim is released artificial respiration should be begun if he is unconscious or apparently dead. This should be instituted before the doctor is summoned, and if only one person is present he should start artificial respiration without delaying to send for a doctor. Even if it is believed that the man is dead artificial respiration should be carried out. Either the Schafer or the Sylvester method can be employed. The former is usually advocated in this country and in America; the latter in Austria. Artificial respiration should be continued for some hours—in fact, until cooling or some other unequivocal evidence of death becomes obvious. This rule ensures the safety of those cases in which the circulation is not completely arrested, the ventricles being in a state of fibrillation; it is just possible that in such artificial respiration may act in the same way as cardiac massage and restore a normal rhythm. Such patients, although "apparently dead," must obviously have some measure of circulation intact, though not apparent to superficial examination. Almost certainly revival after complete circulatory arrest is impossible after an interval of half an hour. Above all, it is necessary to avoid panic and to act coolly. Jellinek once contrasted seven patients with injury from low-tension current, five of whom died, with eight patients who had sustained grave injury from high-tension currents and all of whom recovered. In the former group the emergency treatment was inadequate; the bystanders hesitated as to what should be done and neglected to institute artificial respiration. Even such an obvious act as to switch off the current was forgotten.

The outcome of clinical and experimental evidence is that artificial respiration is the most effective means of resuscitation. Other measures, such as inhalation of O_2 and CO_2, the use of the pulmotor, etc., are suggestive of possible benefit, but seem on the whole less effective.

Method of "Counter-shock"

Laymen are often advocates of the so-called McLaglan's system, or "counter-shock," in restoring a victim of electricity. Thus by violent jarring, pummelling, or shaking they attempt to restore animation to a victim apparently dead. In the *Mining Electrical Engineer* for 1923 we read that "the unconscious victim should be placed in a sitting posture and the nerves of the pectoral arch and diaphragm digitally stimulated." At the same time the rescuer should deliver a violent blow with his knees over the region of the victim's seventh dorsal spine "... in order to stimulate the pneumogastric nerves," and, furthermore, he should emit loud shouts for the purpose of "exciting the auditory apparatus." There is a certain amount of clinical and experimental support for the efficacy of this procedure. It has been stated that a victim falling hard after a shock is likely to recover more quickly than one who does not fall. A baby who had touched a badly insulated lamp was apparently lifeless, but recovered after its mother had shaken it frantically. The laboratory animal whose heart is thrown into a state of ventricular fibrillation by means of a moderate current may recover after the application of a second and stronger current.

The evidence is far from being convincing, however, and scarcely warrants the deliberate adoption of a dangerous method of treatment. Recent careful work by A. Campbell and L. Hill and by Urquhart suggests that counter-stimulation has no beneficial effect on electrocuted laboratory animals.

The treatment of victims shocked and unconscious after lightning-stroke differs in no way from the foregoing. One may refer to a superstition which still survives in parts of the U.S.S.R.: it is believed that persons struck by lightning become highly charged with electricity and that this can be extracted by burying them in earth up to the neck. A recent Press account tells that a doctor in the Ukraine buried six persons struck by lightning, leaving only their heads exposed. Five are said to have survived.

Treatment of Coma

Cardiac stimulants may be necessary as soon as spontaneous respiration is restored. The patient's temperature should be raised by means of hot bottles and blankets. Rectal hot coffee may be of service. In Austria it is customary to apply counter-irritants over the praecordium and the anus. Medicinal treatment is traditionally carried out, though its efficacy is open to question. Thus injections of strychnine, camphor in oil, adrenaline, pituitrin, and ether are conventionally prescribed. In the case of laboratory animals with electrically induced ventricular fibrillation recovery has sometimes followed the intracardiac injection of adrenaline, urethane, strontium chloride, herudin, or intravenous pilocarpine. Such measures, which have to be supplementary to cardiac massage, are, of course, impracticable in human industrial cases.

During the stage of coma supervening upon severe electrical or lightning injuries the treatment will follow in the main that of acute cranial injury. One clinical difference is of importance in that gross intracranial bleeding is not likely to be present. The chief morbid change

will consist of severe cerebral oedema with an associated high intracranial pressure. Again, it is customary at this stage to prescribe hypertonic salines, whether in the form of intravenous injection of saline (30 per cent. solution, 30 c.cm.) or rectal magnesium sulphate (4 oz. in 8 oz. of water). Recent experiences with acute head injuries have abundantly demonstrated the drawbacks—if not the actual dangers—of hypertonic medication, by pointing out that an excessive rise in intracranial pressure usually follows rapidly upon an initial decrease.

Probably the safest—as well as the most effective—measure for the reduction of cerebral oedema after electrical injuries is the prompt withdrawal of cerebro-spinal fluid. This can be repeated as often as required. It must be strongly emphasized, however, that the precise tension of cerebro-spinal fluid should always be determined by means of a spinal manometer at every lumbar puncture. The chief merits of lumbar puncture in electrical coma are: (1) cerebral hypertension and coma are rapidly reduced ; (2) the cerebro-spinal fluid itself may be at an excessive temperature ; (3) the cerebro-spinal fluid may possibly contain toxic products of electrolysis ; (4) there is no danger, as in cases of cranial injury, of starting or restarting dangerous intracranial bleeding.

In cases of motor agitation and delirium accompanying the unconsciousness lumbar puncture should be followed by attempts at sedation. The room is to be darkened and the bed reinforced by padded sideboards. If necessary the patient's limbs can be padded and bandaged, so as to protect himself against injury. An icebag to the head is impressive but probably useless. Purgation is a slipshod method of reducing cranial tension, and is much less effective than lumbar puncture. Injections of morphine or of hyoscine are often efficacious but dangerous ; they are better replaced by the newer and safer drugs such as rectal nembutal, avertin, or paraldehyde, or intramuscular injections of somnifaine or luminal.

Burns

The special features of electrical necroses which influence treatment include: (1) the unusual depth of the lesions and their circumscribed nature ; (2) the rigidity and friability of the surrounding blood vessels ; and (3) the tendency of the lesions to spread.

Two widely divergent views are held as to the correct management of electrical burns: conservative measures are enjoined by Jellinek and others, while Wells advocates immediate radical treatment. Jellinek teaches that early amputations and tissue resections should never be adopted. Except in the rare cases in which dangerous toxaemia has developed, it is better to leave the areas of necrosis alone. The innate healing propensities of electrical burns are stressed, and applications of simple antiseptic vaseline dressings and the use of a splint are suggested. Sometimes, in order to accelerate the separation of slough, Jellinek induces active hyperaemia by means of benzene compresses applied for fifteen minutes and repeated daily.

Blue advocates the following treatment in cases of electrical burns. After thorough cleansing of the wound with soap and water, followed by lavage with sterile water, dressings soaked in ice-cold solutions of aluminium acetate (1/2 oz. to the pint) are supplied. Dead and charred tissue should not be removed. During the stage of repair various dressings may be employed. Dusting with an antiseptic powder may be sufficient ; lint soaked in paraffin (or paraffin with picric acid or flavine) may be applied. Some prefer to cover the injured limb with a cradle in which electric light bulbs are suspended. Skin grafts or plastic operations may finally be necessary. Tannic acid applications prove as satisfactory in electrical lesions as in other types of burn or scald.

Wells differs widely from Jellinek in advocating strongly an immediate resection or débridement of the necrosed tissue. He claims that in this way healing takes place more rapidly and with less ultimate deformity. Resection *en bloc* of the eschar—sparing, of course, such structures as large vessels, nerves, and joints—is followed either by primary suture or by immediate skin graft. Haemorrhage, apparently, is not as difficult to control as might be anticipated. J. P. Tourneaux advocates a similar resection of diseased tissue in electrical burns of the cranium. By trephining the skull beyond the involved areas it is claimed that cranial wounds will heal in one-seventh the time. Blue, however, considers this treatment worse than the disease.

Whichever line of treatment is adopted—radical or conservative—complications are to be expected within the second or third week. Owing to the morbid fragility of the blood vessels surrounding the burns there is a grave danger of reactionary haemorrhage. This complication should never take the nursing staff unawares, for during the third week haemorrhage should be anticipated and instruments and dressings should be close to hand. Ligations of the principal blood vessels is usually required, but it should be emphasized that the ligation must be applied at some distance proximal to the bleeding point, owing to the diffuse spread of the degenerative vascular changes. In the same way, where amputation is necessary, it should be carried out well above the limits of the necrosed area. Otherwise the spreading nature of the burn may cause the flap to be invaded and produce severe secondary bleeding.

THE OUT-PATIENT PROBLEM AND HOSPITAL CONSTRUCTION

THE NEW WESTMINSTER HOSPITAL

BY

E. ROCK CARLING, F.R.C.S.

The problem of dealing expeditiously with out-patients still awaits solution. There will always be a great deal of "waiting" for some ambulatory patients between the first examination and the complete diagnosis. Time must be allowed for pathological and radiological examinations, and in preparation for certain forms of investigation, and for some forms of treatment. That is inseparable from the fulfilment of the purpose of the visit. But the waiting associated with preliminary sorting and classification in the out-patient department subjects many patients to undesirable fatigue, and ought to be minimized as far as possible. One of the difficulties in effecting this reduction of waiting time arises from the structural plan hitherto employed, which necessitates grouping all the visiting patients in a common out-patient department irrespective of their ultimate destination.

A plan under consideration for the new Westminster Hospital seeks to secure the attention of the same permanent personnel for a patient throughout the whole of his hospital career, first as an out-patient and later as an in-patient. By bringing the patient from the first attendance into the knowledge of one sister and one clinical registrar it is hoped to secure much saving of time and some saving of current expense.

Individual Out-Patient Departments

To effect this each unit or firm, with certain exceptions, will have its own out-patient department on the same floor as its wards, and adjacent to them, though reached by a separate corridor. Thus the senior and junior members of the honorary staff will be working in the same part of the hospital, though generally at different times, so as to reduce the intermittency of their presence in the unit.

There will, as in the past, be a "front surgery" on the ground floor and adjacent to it a sorting department under the charge of semi-permanent medical officers of registrar status, but there will be no extensive out-patient

department where all ambulatory cases of whatever type are seen and treated by the junior honorary staff.

As at present a patient arriving casually at the hospital will be sent to the out-patient rooms of the firm of that day. But patients arriving with a personal letter will be sent direct to the out-patient clinic of senior or junior as the case may be.

On every floor there will be an almoner to assist the patient in every way. It will be this almoner's task to make every possible use of the external and internal telephones and other methods of communication to arrange work by appointment. If by error patients arrive at a time when neither senior nor junior is in attendance, it does not follow that the visit will be wasted, for in many cases the doctor's letter or preliminary inquiries by the full-time officers will show that investigations by a special department will be needed, and it may thus be possible to save the time of members of the honorary staff when, by appointment, they do see such patients. All "follow-up" routine—and nowadays this takes a great deal of time—will be done in the unit by the personnel of the firm and will occupy the out-patient rooms which otherwise might be empty. There are, too, many subsidiary clinics that take place at other times than, or extend beyond the time of, the visiting staff's attendance. Squint clinics, speech clinics, varicose vein clinics, ante-natal, post-natal, and child welfare clinics, fracture clinics, and so on, could be so arranged that there should be no question of waste through the multiplication of out-patient rooms.

The Medical Side

It is true that the general physicians do not feel the same need of separate accommodation for the ambulatory patients of each firm as do the surgeons and specialists, and they would have one common out-patient suite on their floor. Even in the case of the surgeons the plan is not, as would at first sight appear, uneconomical, for the same holds good here as in the case of the theatres. The out-patient consulting rooms and theatres will be paired, so that A's theatre and out-patient room will be available for B's use as well as his own unless some special demand makes it essential that it should be in use simultaneously by A. To have two small theatres in which to work is economical of time, and there is no need for much space for onlookers, since students are discouraged from wasting time in watching operations, and there will be in the hospital one large theatre suitable for demonstration work. Similarly it is convenient to have two consulting rooms of moderate size simultaneously in use ; a registrar or first assistant or clerks taking clinical histories in a communicating consulting room facilitates teaching and saves time. The exigencies of the site at Westminster and slight differences of requirement will make it easier for the linking of departments to be by ward above ward rather than by wards side by side as at some other hospitals. To the older generation it is of course simpler to walk along a corridor on one level than to go down one floor in a lift, but the present and future generations are, and will be, more accustomed to lifts and will find vertical proximity just as convenient as lateral. So with the theatres grouped vertically in pairs there will be not only no greater expense but probably even a saving in heating and service as against grouping in a series along a long corridor. In staffing, whether of sisters, nurses, almoners, or porters, the advantage will be with the vertical rather than the horizontal system.

Attendance by Appointment

Where all the work of a unit or firm is grouped together it is believed that the appointment system of attendance will be very much simplified and the time of the visiting staff be saved thereby rather than wasted. It is possible that the number of permanent or semi-permanent paid officers will be greater, but that is a tendency which has been very obvious even with the existing lay-out, and will be, not a true increase due to the plan, but an acceleration necessitated by adopting a structure which more nearly fits the functions of a general hospital than that at present prevailing.

HEALTH OF THE SCHOOL CHILD

DR. MACNALTY'S REPORT

The annual report of the Chief Medical Officer for the Board of Education for 1934 is issued by Dr. Arthur MacNalty, but refers to the work done under the direction and supervision of Sir George Newman. In his introduction Dr. MacNalty utters a warning against that education which is overbalanced on either the mental or the physical side, or is unfitted to the age, sex, habits, circumstances, and state of health of the child.

Nutrition and School Feeding

The report repeats the emphasis of former reports on the necessity for satisfactory nutrition. The total number of school meals provided in the year was 68,100,000, and the milk meals provided free of payment increased to 42,200,000. During the routine medical examination 12 children per 1,000 were found to be malnourished and 14 per 1,000 undernourished. This is a slight increase on the figure of 11.1 for 1933. On the whole the reports received from the districts were reassuring. Special attention has been paid to the nutrition of the pre-school child and of adolescents attending the junior instruction centres. An investigation into the nutritive value of milk, made by a committee of the Milk Marketing Board, is expected to confirm the results published by Dr. Corry Mann ; and the Minister of Health has now definitely decided that pasteurized milk is better than raw milk, the changes of quality being too small to outweigh the great advantage of protection from disease.

Physical Training

Progress in all directions has been made in physical training in elementary schools. The chief danger is that the provision of suitable rooms and equipment and playing fields may lag behind the ability and enthusiasm of the teachers. Striking features of the advance are the transition from formality and limited objectives to freedom and wide scope, and the fusion of various elements into a British system fulfilling the needs of our national characteristics. The report regrets that there are at present only 122 local education authorities who employ organizers of physical training, and quotes some interesting details from local reports. In East Suffolk, for example, it was found that very few of the children could swim, and there was little enthusiasm for this exercise. The organizer, however, has worked so patiently and successfully that now there are over forty swimming centres in the area, and over 500 children gained swimming certificates last year. The total expenditure was approximately £70.

A change in the training of teachers may be looked for. There is at present only one college for men, but the well-known colleges for women provide an excellent course. There is, however, a tendency among head mistresses to desire their gym mistresses to have a shortened university course combined with their physical training, so that they can teach other subjects in small schools. The voluntary associations are finding a growing demand for recreative facilities, and are doing much good work. The education of teachers to train children in hygiene is also receiving continued attention.

Inspection and Treatment

The report stresses again the desirability of co-operation between school medical officer, teacher, and parent, and gives figures illustrating the importance of the detailed medical examination as well as the general review. The number of children inspected during 1934 was 1,794,963,

or 35.4 per cent. of those in average attendance. In addition, 1,231,663 were referred for special reasons, the total representing 59.7 per cent. of the average attendance. The table of physical defects revealed by examination remains much the same as in previous years, except for a rise in the incidence of malnutrition and a continued fall in the incidence of skin diseases.

The physical fitness of secondary school children is on the whole better than that of the elementary school children, but they suffer from the problem of overstrain, on which varying opinions are expressed by different medical officers. Defective vision is also a problem of importance for these older children, and postural defects tend to be commoner among them than among their juniors. There are now 1,916 school clinics, an increase of thirty-six on last year ; those for throat conditions and ringworm have diminished in number. Where possible school medical and maternity and child welfare services use the same health centre, as this promotes both economy and co-ordination. School medical officers continue to report good progress in cleanliness. The use of elastic plaster dressing for impetigo is proving successful, and also obviates the necessity for exclusion from school.

Eyes, Ears, and Teeth

Although health visitors play their part, the most important method of ascertainment of eye defects is the routine medical inspection. The school nurse is also a valuable factor, but none of these methods is successful without the co-operation of the teacher. Unfortunately, children are not tested for visual acuity until the age of 8, but an additional routine eye inspection of the six-year-olds is made by some medical officers and is very valuable. The most satisfactory system for the supply of spectacles is a contract between the local education authority and the local optician, and in some clinics a representative of the firm attends during refraction sessions. The follow-up by school nurses is of the utmost importance. No ophthalmic scheme is complete without special arrangements for the treatment of squint and fusion training. Hitherto the testing of colour vision has not been included in eye examination, but its ascertainment is of great importance to the individual, and in certain areas investigations have been made.

The prevention of acute otorrhoea is mainly a problem of specific diseases such as measles, scarlet fever, and diphtheria, and of the common cold. Early treatment in the acute stage is of great importance to prevent the intractable chronic ear discharge. The report recommends the use of an electric auriscope which would detect slight and potential cases in which there is no frank ear discharge. Figures from Essex show that when a special examination is made a large proportion of children are found to suffer from it or to have suffered from it. Of 2,074 children examined, 100 had chronic otitis media, of which 69 per cent. had only intermittent discharge and 54 per cent. had the disease on one side only. Diastolization continues to give promising results for rhinitis. A possibility that must be borne in mind for the child with otorrhoea is a transfer to an open-air school, for improvement in general hygiene reacts on the local disease. The treatment of the ear itself is often protracted and disappointing. It must be carried out by a specialist at an aural clinic, and it demands the co-operation of many officers under various sections of the public medical service.

There are now the equivalent of 604 full-time dentists, an increase of 25 per cent. during the last five years. During 1934 the amount of work done for each hundred children treated included sixty-seven fillings in permanent teeth, thirty-three extractions of permanent teeth, and 155 extractions of temporary teeth. The report declares that the school dental service is still comparatively young, and that its development must be unhampered by fixed ideas. Local education authorities are increasingly appreciative of the help of the Dental Board in propaganda. A recent interesting development is a scheme for the dental treatment for adolescents in Brentford and Chiswick. This is sponsored by the education authority, and is an attempt to fill the gap between school and dental benefit under the national health insurance. An inquiry into children naturally free from dental caries has revealed one safe generalization only: that the regular use of the toothbrush is not essential for freedom from caries. Of 560 children with sound teeth recorded, 104 brushed their teeth irregularly and 132 never. The dietetic habits of these children gave results that can only be described as bewildering. All sorts of dietetic errors had been committed by those showing perfect teeth.

The Maladjusted Child

The report offers a warm welcome to the smaller child guidance clinics which have recently been established in various parts of the country as the result of the labour of some individual keen enough to give services and arouse interest. It urges the need for many more than the bare score of clinics at present available, and for greater security of support. Last year the Board of Education approved, as a part of the work of the School Medical Service, the Birmingham Child Guidance Clinic. Since this precedent was established several other applications for recognition have been received. It is held that the idea of child guidance has now passed beyond the experimental stage, but the details of organization are not yet by any means stereotyped.

Stammering and other speech defects are being dealt with by an increasing number of local education authorities, and ascertainment has been carried out in a number of areas. Success or failure in the training of stammering children depends mainly on the personality of the teacher, who should, if possible, visit the home and interview both parents. An extra allowance of sugar is useful for this kind of nervous child, and he should also be given plenty of rest and quiet. It is particularly important to ascertain any dental, ocular, or ear, nose, and throat defects that may be contributing to the condition. The Central Association for Mental Welfare has a travelling expert in speech training, who co-operates with school medical officers and lectures to teachers. The question of extending classes to secondary school children is being considered.

Open-air Schools: Nursery Schools

Open-air schools have now been established for twenty-eight years, and have proved their success. On March 31st of this year there were ninety-four day schools and fifty-two residential schools, accommodating 14,705 children. There were also thirty-seven sanatorium schools and sixty-six hospital and convalescent cripple schools built on open-air lines. In London there are nine day open-air schools, and six more for children in the quiescent stages of tuberculosis. The latter provide treatment for the delicate contact, the child discharged from a sanatorium, and for those in the early and non-infectious stage of the disease. Sun-bathing is practised in most open-air schools, and personal hygiene is especially taught in them. The establishment of new nursery schools was suspended during the time of financial stringency, but progress is now being made. There are at present seventy-two recognized schools, accommodating 5,440 children.

Infectious Diseases

During 1934 there was a low incidence of influenza and pneumonia, and the notifications of small-pox were the fewest since 1918. Unfortunately there were increases in diphtheria, scarlet fever, and measles, so that the death rate for school children did not fall, as did the adult, but rose from 2.19 in 1933 to 2.43 per 1,000 in 1934 (age group 5–10). There were 3,719 deaths from measles, but the case fatality does not seem to have increased. Diphtheria caused 4,805 deaths, of which 93.7 per cent. were in children under 15. The fatality rate was 5.9 per cent., but it is not clear whether this rise is the result of an increase in virulence or a decrease in the practice of notifying carriers as cases of the disease. It is clear, however, that a more virulent type of infection is now attacking some areas, and even early antitoxin treatment is not as successful as it ought to be. The importance of immunization is therefore increased. The number of cases of scarlet fever notified was 152,069, the highest since 1914, but the fatality rate remained low. The correlation between scarlet fever and rheumatic fever was again demonstrated by a rise in the deaths from rheumatic fever and heart disease.

England and Wales

Society of Apothecaries

A yeomanry dinner of the Society of Apothecaries of London was held in the ancient Hall at Blackfriars on December 10th, when the Master, Sir William Willcox, supported by the Senior and Junior Wardens, Dr. A. P. Gibbons and Mr. Hugh Lett, received a company of about one hundred. The guests included Sir Humphry Rolleston (Acting President of the British Medical Association); Sir Arthur Robinson (Chairman of the Supply Board) and his successor as Permanent Secretary to the Ministry of Health, Sir George Chrystal; Lieut.-General J. A. Hartigan, D.-G. Army Medical Services, and Air Commodore A. W. Iredell, D.M.S. Royal Air Force; Sir Henry Dale (Director of the National Institute for Medical Research); Dr. T. S. Hele (Master of Emmanuel College, Cambridge); Mr. S. P. Vivian (Registrar-General); Dr. E A. Gregg (Chairman of the London Insurance Committee); and the Deans of the Medical Schools of Charing Cross, King's College, St. Mary's, St. Thomas's, and Westminster Hospitals, and the London School of Hygiene and Tropical Medicine. The toast of "The Society of Apothecaries" was proposed in a few graceful words by Sir Humphry Rolleston, who praised the society for its attractive blend of ancient tradition and great activity, symbolized in the old phrase "mystery and art." He also welcomed back to England from the British Medical Association's world tour Sir William Willcox and a number of his fellow travellers. In his acknowledgement the Master said that no one in the medical profession was more loved and esteemed than Sir Humphry, whose quiet way of getting through committee work and getting work done by committees was a model for all chairmen. Mentioning the names of Dr. Fairbairn, Sir James Purves-Stewart, Sir Henry Gauvain, and Dr. Anderson, who had travelled with the B.M.A. party to Melbourne, Sir William said that they had had many interesting experiences and had learnt much by meeting members of the profession overseas, with whose resource and all-round ability they were all much impressed. Wherever they went they heard appreciation for those who visited them from the mother country and expressions of pride in belonging to the B.M.A. In conclusion the Master mentioned the loss the society had suffered through the long illness of his predecessor, Sir George Buchanan, and the debt owed to Dr. Wakelin Barratt, who had deputized so admirably for them both. In responding to "The Health of the Guests," proposed by Dr. Gibbons, Sir Arthur Robinson said that during his fifteen years at the Ministry of Health he had often been a guest at Apothecaries' Hall, and one of the pieces of advice he gave to Sir George Chrystal was not to miss the society's dinners. Mr. Vivian, speaking also in reply to the toast, recalled the witty French statesman who read out the items of food and drink on the menu at a banquet during an international congress on the registration of causes of death, and having done so said, "There are your causes of death."

Medicine and the Law

The annual dinner of the Medico-Legal Society was held at the Holborn Restaurant on December 13th under the chairmanship of Mr. C. Ainsworth Mitchell, the president. The guests included many distinguished representatives of medicine and law. In proposing the health of the two professions Sir William Willcox mentioned some of the matters of a forensic character which had interested him during his recent world tour under the auspices of the British Medical Association. He had been particularly interested to find in New Zealand that two criminal cases were proceeding, both of which turned upon barbituric acid poisoning, and in Australia that there was a heated discussion as to whether an inquest could be held when the only human remains was an arm ejected from a shark. He was entertained by the Medico-Legal Society of Victoria, a very flourishing body, which modelled itself upon its English counterpart. Law and medicine, said Sir William Willcox, were becoming more closely united owing to the part which medical psychology now played in the administration of justice. He was conscious of a different atmosphere in the criminal courts from that which obtained years ago. Instead of expressions of moral indignation at the conduct of an accused person there was an endeavour on the part both of judges and advocates to follow the underlying psychology. Lord Dawson of Penn, in responding to the toast, took up the point of the closer contact of medicine and law, saying that the ambit of medicine included mind as well as body, and that the linkage between mind and body was to be found in the secretions of the internal glands. A slight increase in the thyroid or a slight decrease in the sex hormones might determine such noteworthy changes in conduct and behaviour as to affect seriously the doctrine of responsibility. This was a question which could not be postponed much longer, and would have to be given more weight than in the past. Most of our laws had been passed in days when medicine was concerned almost solely with persons disabled by illness, but it was now occupied in forestalling illness by early diagnosis, and in building up health and preventing disease. Along this path it was interested in the behaviour reactions of the individual, which also were the preoccupation of the lawyer. It was therefore just and proper that if the law protected society from damage caused by crime, medicine should protect it and the future generation from the transmission of disease. He quoted the Admiralty Court, which had expert assessors on the bench, as a precedent for other courts when the complex problems of criminal responsibility had to be determined. Mr. Claud Mullins, metropolitan police magistrate, who also responded to the toast, described himself as a "hopeless law reformer," and said that lawyers were ready to reform everything except the law. One infirmity of English lawyers was that they assumed that because the lawyer was competent to ascertain guilt or innocence, he was thereby equipped to decide as to punishment. In fact, the science of criminology was something very different from what the lawyer learned at the Inns of Court; the science, indeed, hardly existed in this country. Sir Edward Tindal Atkinson, Director of Public Prosecutions, supported the idea lately put forward by Lord Atkin of a National Medico-Legal Institute, possibly a branch of the University of London, which would be a teaching institute as well as a police laboratory, where coroners, prison doctors, advocates, members of the police force, and even judges themselves could receive training for diplomas. Other brief speeches were made by the President, who mentioned that the membership of the society was now 400; by Mr.

John Evans, president of the Society of Public Analysts, in reply to the toast of "The Visitors"; and by Dr. Robert Hutchison, President of the Royal Society of Medicine.

Royal Surgical Aid Society

The seventy-third annual meeting of the Royal Surgical Aid Society was held at the Mansion House, London, on December 9th, the Lord Mayor (Sir Percy Vincent), accompanied by the Lady Mayoress and attended by the Sheriffs, presiding. The Lord Mayor said that if it were not for the activities of the society many poor people would have to go without the appliances they needed in times of affliction. He was particularly pleased to hear of the society's success in meeting an emergency in the distressed areas. The statistics given in the annual report showed the extent to which the society was relieving suffering humanity. Tributes were paid in the course of the meeting to the work of the late Mr. Ernest Muirhead Little, one of the society's surgeons for forty years, who died in October last, to Mr. Bernard Goulden, ophthalmic surgeon, who had recently retired, and to the present surgeons, Mr. Laming Evans, Mr. Whitchurch Howell, Mr. Cecil Flemming, and Mr. N. Harold Ridley. Professor Grey Turner said how comforting it was to a surgeon who was doing his best for a patient to feel that his endeavours were not likely to be frustrated by subsequent neglect, but would be completed by such after-care as the society afforded. The annual report, which was adopted, stated that the total number of patients relieved during the past year was 26,447, and of appliances supplied 33,767. The appliances in chief demand were abdominal belts, sets of artificial teeth, high cork and special boots, spectacles, stockings and knee-caps, trusses, and valgus pads. The annual subscriptions showed a decrease of £430, and there had been a falling off of £1,370 in special donations for cases. Legacies, on the other hand, at £12,733 constituted a record. The report also described a special effort made during the year on behalf of distressed areas.

Old Epsomian Dinner

The fifty-eighth annual meeting and dinner of the Old Epsomian Club was held at the Hotel Great Central, London, on December 12th under the presidency of Mr. J. Norman Eggar. There was a large and enthusiastic attendance, and the guests included Lord Leverhulme, president of Epsom College; Dr. John Fawcett, honorary treasurer; the Rev. A. C. Powell, head master; Dr. Henry Robinson, vice-chairman of the College Council; Dr. H. R. D. Spitta, chairman of the executive committee; Dr. N. G. Horner; Dr. E. C. Morland; and Mr. Oswald Hempson. In proposing the health of the president of the society, Sir Cosmo Parkinson (Assistant Under-Secretary of State, Colonial Office) drew an entertaining contrast between popular ideas about the working life of the man of business and that of the civil servant, and made warm references to the varied career and perpetual youth of Mr. Norman Eggar, who kept up his intimate touch with the school by living at Epsom. Mr. Eggar, in his acknowledgement, referred to the long list of distinguished medical men and others who had held office before him, and to the series of twenty annual cricket matches between the school and the old boys, which he himself had arranged. In reply to the toast "Floreat Epsomia" Mr. Powell spoke of the fourteen happy years of his headmastership, and gave a general account of the successes gained in study and sports during the past twelve months, declaring confidently that in work, in games, and in general tone Epsom College could take pride in its record. The health of the guests was proposed by Dr. Daniel Twining in an amusing speech embellished with apocryphal stories, and the toast was responded to by Mr. J. Niven (president of the Baltic Exchange), by Dr. Fawcett, and by Dr. J. A. Drake (dean of the medical school of King's College Hospital). The formal proceedings ended with the singing of "Canticum Epsomiense," and congratulations to an old Epsomian, Mr. C. S. Taylor, on being elected M.P.

Scotland

District Nursing in Scotland

Presiding at the annual meeting of the Scottish Branch of the Queen's Institute of District Nursing at Edinburgh on December 9th, Sir Robert Philip stated that the supply of district nurses in the past year had been found adequate. Seventeen new nursing associations had become affiliated with the Institute and employed Queen's nurses. In some cases this had been made possible by grants-in-aid from the Commissioner for Special Areas in Scotland of sums varying from £25 to £200. The maternity nursing of Queen's nurses had been very satisfactory; in 967 cases attended by Queen's nurses in Glasgow there had not been one maternal death, while in Edinburgh, with 1,166 maternity cases attended, there had been only two maternal deaths. A total of 128,025 cases had been nursed during the past year, involving 2,263,915 attendances. It was gratifying to note that whereas the maternal deaths from puerperal causes in cases not attended by Queen's nurses was 6.7 per 1,000, in cases attended by Queen's nurses the mortality was 3.2. Tuberculosis work had been undertaken by the Institute in association with other bodies; they had Nurse Commissioners for Tuberculosis who had been at work for some six or seven years in Scotland, especially in the north. There was much ignorance regarding the very simple causes of tuberculosis and the methods of prevention, and this was being corrected by the educational work of these commissioners.

Health of Stirling

The annual report of Dr. Thomas Adam, medical officer of health for the county of Stirling, deals especially with infantile and maternal mortality. After pointing out that the infantile mortality rate of half a century ago (150 per 1,000 children born) had been reduced under present social conditions to less than one-half of that figure, Dr. Adam states that the maternal mortality rate, which is closely related to it, remains much the same from year to year—namely, five maternal deaths per 1,000 live births. Child-bearing should be naturally a healthy physiological act, but in too many cases it was accompanied by some diseased condition. Much of the midwifery practice among the working classes was in the hands of midwives or handiwomen. Very often these women attained their position because it was recognized in the neighbourhood that they had outstanding ability. Others, however, seemed to have little idea of the extreme cleanliness required and were "rough and ready" in their methods. It was well known that difficulties and complications were more likely to arise in the case of first births, and it was also recognized that the size of families had been growing progressively smaller, with the result that the proportion of first births was increasing. It might therefore have been expected that the maternal death rate would have increased, and the fact that it had not done so might be credited to the better modern training, both of medical men and midwives. The county of Stirling had been the pioneer in providing maternity homes connected with voluntary general hospitals. Dealing with the housing of the working classes, Dr. Adam states that under local authority subsidy 4,824 houses have been built or brought up to modern requirements. This is 28 per cent. of the whole 17,500 houses in the landward part of the county.

Edinburgh Samaritan Society

At the annual meeting of the Samaritan Society the chairman intimated that there was a small deficit on the year's work of the society, which existed for the purpose of looking after patients who had left the Royal Infirmary of Edinburgh and who were still in need of assistance. This society saved the Royal Infirmary a good deal of money, and as the annual cost of the Infirmary was about £170,000 annually, every saving was to be welcomed. The Very Rev. Charles L. Warr

said that the public should be urged to support the valuable work of this society. During the past year, in addition to old cases, it had dealt with 397 new ones. The work of the society had steadily extended since its institution in 1879, and it was one of the most valuable and helpful organizations in the city. The speaker referred to a large restaurant in the Canongate which the society hoped to open in the spring, where nourishing food would be supplied at cost price. It was expected that three substantial meals daily could be provided at a cost of 1s., so that men who were unemployed or living on public relief would no longer need to suffer the dangers and disabilities of under-nourishment. There would also be a department for supplying special and invalid diets.

Physiology in the Pharmaceutical Curriculum

The inaugural sessional address to the North British Branch of the Pharmaceutical Society of Great Britain was delivered by Dr. de Burgh Daly, professor of physiology in Edinburgh University, on November 27th. Taking as his subject "Artificial and Natural Regulation of Body Function," Professor Daly said that it was a matter for congratulation to physiologists that the Pharmaceutical Society was now extending its syllabus by the introduction of a course on physiology. This might be regarded as a reorientation of views regarding the action of drugs and the treatment of disease. The first step towards successful treatment was generally the recognition of the cause of some pathological condition. The second step was frequently the reproduction of that condition in lower animals so that a detailed study could be made of the factors determining its onset, progress, and elimination. This line of approach had to a large extent become the foundation on which the superstructure of medical treatment was now built.

Reports of Societies

AGRANULOCYTOSIS

The Sections of Therapeutics and of Medicine of the Royal Society of Medicine combined for a discussion, on December 10th, with Dr. DOROTHY HARE presiding, on "Agranulocytosis."

Pyramidon as a Causative Factor

Professor L. J. WITTS said that the subject was ripe for discussion in this country, as was evident from a recent inquest at Shoreditch, reported in the *British Medical Journal* of December 7th (p. 1135), when a number of statements were made which he could not accept as true. He himself described a series of seven patients with agranulocytosis, of whom five had used pyramidon and one salol; in the seventh no inquiry about drugs was made. Incidentally one of the patients was a surgeon and two others were doctors' wives. The high proportion of cases in medical families might have something to do with the samples which found their way through the doctor's letter-box. He described the post-mortem findings in one fatal case. The pathological changes suggested an arrest in the maturation of the myeloblasts comparable with the megaloblastic degeneration of the bone marrow in pernicious anaemia.

The evidence incriminating pyramidon was threefold: circumstantial, experimental, and direct. The circumstantial evidence was that the majority of the patients who had agranulocytosis had taken pyramidon, and the rise and fall of the incidence of agranulocytosis in a community or hospital corresponded with the introduction, or abandonment, of pyramidon. As for experimental evidence, in animals it was impossible to produce the complete syndrome by giving pyramidon, but the administration of this drug caused changes in the marrow, with increase in the number of primitive cells, and it was found that the animals which had been given pyramidon were unable to produce a leucocytosis on the injection of nucleic acid. The direct proof of the culpability of pyramidon had been obtained in many cases by a test dose, and with a patient who had suffered from agranulocytosis quite a small dose of pyramidon, 3 or 5 grains, caused a depression of the white cell count within a few hours, and it might be several days before a return to normal, the patient meanwhile exhibiting general symptoms such as malaise, sore throat, and pyrexia.

All cases of agranulocytosis, however, were not due to pyramidon, and there were patients who had taken even massive doses without the development of symptoms. Agranulocytosis was a relatively rare disease (although 1,600 people in America had died from it), yet pyramidon was a commonly used drug. But in spite of these reservations pyramidon must be regarded as the chief cause of agranulocytosis.

Methods of Treatment

As for treatment, transfusion, parenteral liver extract, and non-specific therapy with ordinary leucocytic stimulants appeared to be irrational and ineffective. There had been a deplorable tendency to speak of this disease as granulocytic anaemia; it was not anaemia—the red cells and the platelets were perfectly normal. He had collected from the literature the cases which had been treated by injections of liver extract; there were sixteen of these, but a number had had other treatment as well, such as pentnucleotide or transfusion. Of the sixteen cases seven had recovered. Small stimulating doses of *x* rays, or treatment with nucleotide, had a sounder theoretical basis, but in practice these agents had proved disappointing. Pentnucleotide in the hands of the originators of the remedy had been extremely successful, but up to the end of June of this year fourteen cases of acute agranulocytic angina treated with pentnucleotide had been recorded in the *British Medical Journal* and the *Lancet*, and of these only five had recovered—little better than the incidence of spontaneous cure of the disease. Why were there not better results with this drug? One reason was perhaps insufficient dosage. Jackson in America gave 50 c.cm., and most people in this country gave less than that. Another reason was the occurrence of extremely troublesome reactions. Agranulocytosis was a very serious illness, and treatment was so unsatisfactory that prophylaxis ought to be their earnest concern. It was a dreadful thing that ignorant people should be tempted to buy proprietary remedies which had great potentialities for harm, and that medical men should prescribe hypnotic and sedative tablets in ignorance of the fact that they contained pyramidon as an active principle. The first law in therapeutics was to do no harm. The time had come when pyramidon should be regarded as a dangerous drug; all remedies embodying it should have the fact clearly printed on the container, and those prescribing it should exercise the same scrupulous care as with morphine or atophan.

Aetiological Aspects

Sir WILLIAM WILLCOX said that he had been interested lately in the aetiological aspects of agranulocytosis. There appeared to be a defect of the bone marrow, the myeloid tissue being unable either to produce polymorphonuclear cells or, having produced them, to deliver them into the blood stream. Bone marrow was an extremely important tissue. The average life of a polymorphonuclear cell had been shown to be about three days, so that continued active functioning of the bone marrow was essential for health, and indeed for the continuance of life. Agranulocytosis might be a primary idiopathic disease or secondary to some known cause. It was likely that as knowledge of the functions and susceptibility of the bone marrow increased the primary group would diminish or disappear, as had been the case with acute yellow atrophy or necrosis of the liver. The disease was more common in females, and the maximum age incidence was in females from 40 to 50, and in males from 60 to 70; but no age was exempt. The condition was closely allied to leucopenia, and was indeed a variety of it, the granular leucocytes being specifically vulnerable. Nutritional factors might play a more important part than was at present recognized. Research on these lines would be

most helpful, and might explain the causation of the idiopathic group of cases.

Turning to associated conditions, Sir William Willcox said that the enteric group—typhoid, paratyphoid A, and paratyphoid B—was well known to be associated with leucopenia and with specific diminution of the granular leucocytes. It seemed probable that those cases, not infrequently seen in the past when typhoid fever was much more prevalent and severe, in which a membrane was found in the throat and respiratory passages were associated with secondary agranulocytosis. In several pathological museums specimens were to be seen from typhoid cases in which such membranes extended right down the larynx and trachea. Chronic tuberculosis was occasionally associated with agranulocytosis, and fulminating streptococcal or staphylococcal septicaemia might give rise to the condition. In chronic dental sepsis he had on many occasions seen a marked leucopenia, with great diminution of the granular leucocytes. Pneumococcal infections were stated to be associated occasionally with agranulocytosis, although generally the reverse occurred—that is to say, they were associated with leucocytosis. Undulant fever, which was not uncommon in this country, was usually associated with a leucopenia and diminution of the granular leucocytes. Protozoal diseases, such as kala-azar, malaria, amoebic dysentery, and trypanosomiasis, had been instanced in the same connexion, and the same was true of various diseases of doubtful causation, such as influenza, measles, mumps, and dengue.

The Role of Drugs

With regard to chemical poisons, amidopyrine, or pyramidon, was in the limelight at the present time. It had been used extensively ; he had himself prescribed it very largely in rheumatic cases, and a retired colleague, Dr. A. P. Luff, a well-known specialist on arthritis and gout, had used it in thousands of cases as his favourite prescription. The curious thing was that these cases should have cropped up during the last few years. He had never in his own practice seen a case of agranulocytosis from pyramidon, although he had often prescribed the drug. There could be no doubt that there was an allergy to this drug, a susceptibility possessed by certain people on whom it exercised its remarkably toxic effects. He quite accepted the statement that pyramidon was one of the common causes of agranulocytosis, but he would not go so far as Professor Witts in saying that the majority of the cases had been due to it. The barbituric acid derivatives had on many occasions been associated with agranulocytosis. Evipan, given intravenously, seemed to have a very deadly effect on the white cells. Only a few days ago at a meeting of the Odontological Section he had warned the dental profession against the free use of evipan intravenously. In many of the cases Plum, in Denmark, had published there had been the deadly combination of pyramidon with allonal. Acetanilide was a drug which would cause agranulocytosis. Indeed, it had been suggested that the essential element in drugs causing agranulocytosis was the benzimide nucleus. That was going a little too far, because many toxic drugs could affect the bone marrow apart from the benzimide group. Professor Witts had incriminated salol ; he thought this was the first time salol had been quoted as a cause, and if salol, then their " universal friend " aspirin would soon come into the picture. Di- and tri-nitrophenol and the salvarsan compounds were known to be concerned in agranulocytosis, also compounds of lead, arsenic, antimony, and bismuth, and, again, compounds of silver and gold. Cases were recorded in America three years ago in which factory girls had been in the habit of putting a brush charged with mesothorium between their lips, and a number died of agranulocytosis.

Physical causes included continued over-exposure to x rays and radium, traumatic and anaphylactic shock, and achylia. Certain blood diseases were associated with agranulocytosis, as, for instance, aplastic anaemia, pernicious anaemia, and aleukaemic lymphatic leukaemia. In reviewing these cases there would be a general acceptance of the frequent association of profound bacterial, coccal, protozoal, and virus infections as an aetiological factor. As regards drugs one must be careful to distinguish between *post hoc* and *propter hoc*, especially in view of the enormous amount of drugging going on at the present day, not only by medical prescription, but in the way of patent medicines, and quite a number of cases of agranulocytosis had been published in this country in which careful inquiry failed to show that any incriminating drug had been taken. But a good many cases were due to drugs, and the drug most to the fore at the moment was pyramidon, but care must be taken to review all the possible causes, for some profound toxic factor due to infection might account for the condition. Sir William Willcox concluded by mentioning three cases which had come under his notice recently. In one, a fatal case, there was no evidence of incriminating drugs. In another pyramidon had been taken, but only after the onset of the illness. Pentnucleotide was given, 40 c.cm. a day on two days, and the patient recovered. The third case was the one which was concerned in the Shoreditch inquest, and although pyramidon tablets had been taken occasionally it was hardly conceivable that the pyramidon could have caused the condition.

An Aetiological Classification

Dr. E. C. WARNER suggested the following basis of classification: (1) the non-production of myeloblasts ; (2) plentiful production of myeloblasts which failed to be transformed into myelocytes ; (3) normal production of myeloblasts and myelocytes which failed to be transformed into granulocytes. It was probable that the condition in the first group was invariably fatal, in the second group often fatal, and that the third group was responsible for many of the cases that had been lately described. The earlier cases represented failure of the first or second process, and were described at necropsy, and cases in the third group were now coming up to be described. In acute cases the failure was probably in the first and second groups, and in chronic cases in the third. In addition to the acute cases, subacute, chronic, and relapsing were now recognized, and in many of these the absence of drugs as a causative factor had been proved. The symptoms present in the subacute and chronic cases were often very constant. Fibrositic pains tended to occur, the patient lost weight to the extent of a stone or more, but, apart from local inflammatory conditions in the mouth, by far the most important group of symptoms was the complete mental and physical exhaustion with drowsiness. From a prognostic point of view, in these subacute and chronic cases any relapse might prove fatal, but the prognosis was far better than in the acute cases.

His lines of treatment were briefly summarized. They included, first, measures to reduce the degree of exhaustion. Scrupulous care of the mouth was essential. Possibilities of infection, however slight, must be avoided. Operative intervention of any kind, such as dental extraction, or tonsillectomy, or incision of an abscess, must on no account be undertaken during the period when the agranulocytosis was present. Diet might be of importance. So far little was known of the factors responsible for the formation of myeloblasts and the transformation of the myeloblasts into myelocytes, and it was possible that some day a chemical agent would be found as useful for stimulating these processes as liver therapy in pernicious anaemia.

Cases Seen in Fever Practice

Dr. J. D. ROLLESTON said that ever since agranulocytosis was first described by Schultz in 1922, and also in its faucial manifestations as agranulocytic angina by Friedman, he had taken an interest in the disease. As a matter of fact, as illustrating what a rare disease it was, in over thirty years' fever practice he had seen barely half a dozen cases. As long ago as 1912 he had written a paper on the subject. Three stages in the history of this question might be traced. The first dated from the beginning of scientific medicine and lasted until about 1826, when Bretonneau separated diphtheria from all other forms of sore throat, and maintained that many of the forms of gangrenous angina were really diphtheria. In the second stage Trousseau maintained that there was a true form of gangrenous angina distinct from diphtheria. It was

only since 1922 that this agranulocytic angina had been recognized. The first cases he saw were middle-aged women, cases characterized by a terrible fetor that necessitated their isolation, but he had seen some cases in children. None of his cases were associated with drugs, but it was interesting, in connexion with what Professor Witts had said as to the dangers of pyramidon, that pyramidon had been recommended almost as a specific for measles. Therefore they should be very careful in ordering that drug.

The Leucopenic Foundation

Sir KENNETH GOADBY said that the general trend of opinion was that there was a leucopenic foundation for all these cases, and what the exact exciting cause might be was not very clear. It might be a chemical agent in the form of a drug or a pre-existing leucopenia due to some chronic bacterial infection, and then some circumstance came into play which caused the fulminating outbreak. He recalled the time when all pernicious anaemia was ascribed to oral sepsis, and now, although that might be an exciting or associated cause, they recognized that pernicious anaemia was in its aetiology of fundamentally different type. Probably they would come finally to the conclusion that these cases of agranulocytosis were due to a special type of disease involving a specific factor and associated with other factors. Leucopenia might possibly be regarded in the same way as the temperature chart; it might be taken as an index to the condition of the bone marrow. In a case of agranulocytosis with which he had been concerned, with Worster-Drought, the condition was a chronic relapsing one, although the actual attacks were exceedingly severe. On each occasion of relapse there was a definite prodromal condition of sleepiness and languor before the temperature began to rise. He had the opportunity on three or four occasions of obtaining blood counts during that prodromal stage, and on each occasion there was a definite drop in the total leucocyte count, and more particularly in the number of granulocytes. The mouth symptoms occurred in each relapse, but not until the remaining symptomatology of the case was fully established. Cases had been described as associated with, or possibly due to, Vincent's angina, but the case he was mentioning differed from Vincent's angina in that in the mouth there was not the sharp, red demarcation found in that condition. The surface sloughing also was very different. It was also distinguishable from Vincent's angina in that there were no Vincent's organisms. In treatment he had had the opportunity of trying a manganese nucleotide and a yeast nucleotide, but they gave no reaction at all, either on the temperature curve or the blood count, but directly he went back to pentnucleotide, 10 c.cm. twice a day, he got, after the third or fourth injection, a fall in temperature and an improvement in the leucocyte count.

Dr. HERBERT BROWN analysed fourteen cases which had been recorded in the *British Medical Journal* and *Lancet* during the last year. Only three recovered—a mortality of 78.5 per cent. Only three were due to amidopyrine; in the majority of others there was a history of sepsis. Another important point was that in the majority of the cases the diagnosis was made only at a very late stage in the disease, but there was already extensive sloughing of the pharynx, and three of the patients had been admitted as cases of diphtheria to an isolation hospital, and died within twenty-four hours. A point to be remembered was that in a great many of these cases there was a history of definite sepsis, generally in connexion with the mouth, pharynx, nose, or even the teeth. Dr. S. W. PATTERSON described a chronic case in a man of 23 who had been under observation since 1930, when the condition was first recognized. He had had numerous recurring attacks treated by pentnucleotide, and had been seen by many haematologists. When he recently came again under observation it was found that more than 10 per cent. of the white cells showed a disrupted condition, or what American authors called a "smudge." The speaker mentioned other observations carried out during the last four years on this condition of disruption of the cells. It seemed possible that there might be some underlying defect of the myeloid-producing structures which gave rise to a fragility of the cells. Dr. GEOFFREY KONSTAM mentioned a case which he had seen the previous evening, that of a very obese woman admitted as a case of diphtheria. It was mentioned that she had been taking some tablets for rheumatism, but it was not yet known what they were—possibly they contained pyramidon. The clinical features were great dyspnoea and restlessness.

The CHAIRMAN (Dr. Dorothy Hare) suggested that clinicians should look out for and study the mild relapsing cases from which eventually more might be learnt of the factors governing the other cases in which the patients died so rapidly.

DENTAL INFECTION IN THE ARMY

At a meeting of the United Services Section of the Royal Society of Medicine on December 9th, with Air-Commodore A. V. J. RICHARDSON in the chair, a paper was read by Major S. H. WOODS of the Army Dental Corps on chronic dental infection as a cause of inefficiency in the Army.

Major Woods pointed out that the soldier class had continuous dental treatment, while the officer class had not. About 30,000 men of the soldier class left the Service annually, to be replaced by young recruits, most of whom had had no previous dental treatment other than the extraction of an aching tooth. They were examined annually, and received continuous treatment throughout their service. The highest dental standard of function was maintained, and maximum restoration was the aim. In 1933, excluding India, the number of men whose dental treatment was completed was 65,000; the number of teeth restored was 212,000; and the number of root fillings was 1,380, or approximately one root filling to every fifty men whose treatment was completed. Carious and traumatic dead teeth were invariably extracted, thus eliminating cases of periapical infection from this source. Paradontal disease was seldom seen in men with less than fifteen years' service; it became more evident in soldiers approaching the age of 40. The dental condition of the soldier class was under continuous control, closed infection was practically non-existent, inefficiency due to dental causes was rare, and if he had had to rely on the soldier for the cases he proposed to bring before the Section his paper could hardly have been written. On the other hand, the treatment which the officer might receive in the Service was a matter of chance; he continued to receive treatment from civil dental practitioners, and his dental condition was not under continuous supervision. Hence disabilities directly attributable to or influenced by his dental condition were very common in the officer.

Some typical cases treated at Millbank were described, showing the systemic effects produced and the results of elimination of the dental focus. These included several cases of acute or chronic antritis; certain eye cases, of which choroiditis and iridocyclitis were the commonest; lupus erythematosus; cases of gastritis and gastric and duodenal ulcer in which advanced paradontal disease was considered to be primarily responsible for the disability, though in each case the masticating efficiency was very good; various rheumatic infections, not, however, including osteo-arthritis, which, in the speaker's experience, was not intimately connected with dental infection; and cardiac affections, tachycardia being frequently of dental origin, and myocarditis also having been observed. In all these categories of cases the elimination of a dental focus had led to a cure of the disability or modified its course. In the estimation of the degree of causal relationship between the dental infection and the disability each case required most careful clinical investigation as well as transillumination and radiography. He emphasized the need for close personal co-operation between the dental and medical officers. While the medical notes of the case were always available for the dental officer, and might give a fairly clear outline, they were not infrequently incomplete, or the diagnosis was provisional or too vague,

Surgeon Captain FLETCHER, R.N., said that similar experiences could be recorded from the Navy. He recalled the case of an officer with a severe rheumatic affection involving the spinal column which cleared up very considerably after removal of the infected wisdom teeth. In another case severe corneal ulcers had resisted every effort at treatment until the dental infection was tackled. He thought that the dry type of pyorrhoea was very often overlooked in the Services; his experience in the Navy was that a fair number of pyorrhoea cases were found in men from about the age of 34 onwards. In the Navy the officer was a little more fortunate than in the Army because he received dental treatment practically from the time of entry, and was encouraged to continue it, with the result that the condition of the officer in this respect was as good as that of the ratings in general.

Colonel J. HEATLY-SPENCER said that not many people realized the enormous amount of dental work which was being done in the Army. In 1930 the total number of completed dental treatments was about 72,000; in the present year those treatments had risen to 81,000. The results were reflected in the decreasing incidence of disorders of the digestive system, including gastric and duodenal ulcer, appendicitis, colitis, and less disabling conditions. The decrease represented 18 or 19 per cent. during the last five years, in spite of an increase in the total number of men in the Army. He was not, however, prepared to accept dental sepsis as a primary cause of gastric or duodenal ulcer; it was far more likely to be concerned with some disturbance of amino-acid production.

Group-Captain H. E. WHITTINGHAM, R.A.F., gave some particulars of the dental condition of aircraft apprentices aged 14 to 18. In a strength of 2,085 the following conditions were found on entry and after routine treatment:

	Gingivitis	Pyorrhoea	Tartar	Caries	Markedly Irregular Teeth
On entry ...	25 %	3 %	46 %	98%	20 %
After routine treatment	15 %	2 %	1.5 %	1 %	3 %

He also compared these R.A.F. youths with the condition of 655 boys in an Army school, and found the dental defects in the latter to be about double those in the former. He had also investigated the condition from the point of view of tonsillitis incidence, and found that 22 per cent. of boys with unhealthy tonsils showed gingivitis, whereas only 14 per cent. of boys with normal tonsils showed this condition. The preventive treatment of the individual largely centred around a well-designed toothbrush and its proper use.

Replying on this last point, Major WOODS said that he recommended a stiff brush, serrated, with widely spaced bristles. In using it, the movement should always be from gum to tooth, downwards with the upper teeth, upwards with the lower, and never up and down indiscriminately. He instructed the Army youths to brush the teeth twice a day—after breakfast and the last thing at night.

RABIES AND BATS IN TRINIDAD

At a meeting of the Royal Society of Tropical Medicine and Hygiene on November 21st Dr. ERIC DE VERTEUIL and Professor URICH gave an account of paralytic rabies, with particular reference to its occurrence in Trinidad and its transmission by bats.

In 1906 a disease of a paralytic type broke out in epizootic form among cattle and other stock in Santa Catarina, Brazil. Since then it has persisted there in sporadic form. In 1921 Haupt and Rehaag, after having caught a bat in the act of biting a cow in the daytime, proved that the disease was actually rabies transmitted by the bats which harboured Negri bodies. Destruction of dogs was not followed by any diminution in the number of cattle affected. It was noted that the disease occurred most commonly where the vampire bats were most numerous; a river impassable to dogs afforded no hindrance to the spread of the infection. In 1931 and 1934 severe epizootics broke out among cattle in the State of Matto Grosso as well as in the original focus of Santa Catarina. On this occasion it was conclusively proved that the vampire bat, *Desmodus rotundus*, was the vector. No attempt appeared to have been made to control the bats, owing probably to their very wide distribution, but wholesale antirabic vaccination (*virus fixé*) was said to have conferred immunity on the cattle. The symptoms of the disease were similar to those exhibited by any herbivorous animal bitten by a rabid dog. In 1925 a disease causing sixty deaths broke out among cattle near Port-of-Spain, the capital of Trinidad. In subsequent years it spread to other parts of the island, and was now considered to have been responsible for the death of several thousand animals. The disease, which had a mortality rate of 100 per cent., was regarded at first as a form of botulism till 1929, when there were thirteen fatal human cases of what was thought to be acute anterior poliomyelitis. There were three further cases in 1930 and one in 1931. A study of post-mortem material by Pawan in Trinidad and Hurst at the Lister Institute revealed the true nature of the condition, which was no other than paralytic rabies in man. About this time Pawan demonstrated Negri bodies in a number of fruit-eating and vampire bats captured in the daytime while attempting to bite animals or each other. It thus became clear that the paralytic disease of cattle and human beings was no other than rabies transmitted by vampire bats. Since 1931 further human cases had occurred, bringing the total to fifty-five, so that it had become evident that in Trinidad, and probably also in many parts of the South American continent where human cases had not yet been reported, the vampire bat was a danger to domestic stock and also to human beings by virtue of its power to convey rabic infection to its victims. It was interesting to note that in Panama the vampire bat had been incriminated as the vector of another disease. Horses suffered from a fatal form of trypanosomiasis, which they might acquire through the bites of infected bats, which in their turn had obtained the infection from cattle which acted as carriers of the trypanosome in question. The demonstration that the blood-feeding bat was a grave source of danger, quite apart from the wounds it inflicted, had led to an intensive investigation of the bats of Trinidad, with a view to the elaboration of methods for exterminating them. It was soon found that there was only one blood-feeding bat, the true vampire *Desmodus rufus*, and it became possible to confirm the observations of Dunn, made in Panama in 1932, that the old legend that the bat hovered over its victim, which was fanned to deep sleep by the movement of the wings while the bat sucked its blood, was a myth. Dunn showed that the bat always alighted, crawled to a suitable spot and, as a kitten lapped milk from a saucer, lapped the blood which flowed from the wound inflicted by its upper incisors. The vampire bat, although it could transmit rabies to other bats by biting, was itself the only transmitter to man and to domestic animals, a fact which simplified considerably the problem of combating the disease. Another favourable feature was its relatively slow rate of multiplication. The period of gestation was not less than three months, and only one young was produced at a time. The feeding habits of the bat were such that after a full meal of blood it was so distended that it was unable to fly far from its feeding place. Accordingly, it sought a digesting place, some near-by disused tunnel or deserted building, where it could remain undisturbed for some hours until the relief of tension allowed it to fly to its regular sleeping place, which might be a mile or two away. It returned night after night to the same feeding and digesting places, so that when these had been located it became possible to destroy the bats. The regular sleeping places were frequently caves and hollow trees, which could be recognized by the characteristic dropping on the ground below the spot where the bats were lodged. As many as 162 vampire bats had been captured in one cave, and 117 in one tree. The bats were wholly nocturnal, but it had been noted that rabic bats might suffer from a form of excitement which

led them to fly and bite during the daytime. They transmitted infection not only to man and cattle but also to their own kind, and even to other species of bat. These last, however, not being blood feeders, did not constitute a danger in themselves, although transmission from bat to bat of any kind might occur during fights. Various methods of bat destruction had been tried. The most effective method was to discover the sleeping place, and to capture the bats in nets or shoot them. Poisoning by "cyanogas A dust" had also given good results. Use had also been made of the bat's habit of returning each night to the same wound on the same animal. The application to the wound of a paste containing strychnine had resulted in the death of many bats.

General Discussion

Professor J. C. G. LEDINGHAM referred to the investigations by Dr. Hurst and his co-workers at the Lister Institute with material received from Trinidad. This had been supposed to be from fatal cases of some kind of poliomyelitis or ascending myelitis, and it was a surprise when sections of the brain of the first monkey which had succumbed to intracerebral inoculation revealed Negri bodies. This discovery necessitated the antirabic vaccination of a laboratory assistant who had been bitten a short time before this by the monkey. Professor Ledingham thought that the discovery of rabies in the bat raised the whole question as to the ultimate reservoir of the rabic virus: was it actually the bat, or was it some carnivore?

Dr. HURST said that one of the most important points brought out in the paper was that, from investigations which had been made in Brazil, it appeared that the bat might enter into a latent phase of rabic infection during which the saliva remained infective for months without there being any indication of nervous disease. This phenomenon had not been noted in any other animal, and, if confirmed, represented a discovery of great importance. Dr. LINDSAY referred to an outbreak of a paralytic disease of cattle which had occurred in Paraguay during his residence there. It was regarded as a bovine form of mal de caderas, a term usually applied to a trypanosomiasis of horses. The disease attacked cattle, sheep, pigs, and even cats. The true nature of the disease had been disclosed by the discovery of Negri bodies in the brains of cattle and bats. The epidemic of 1928–31 was preceded by an epidemic of rabies among dogs which almost exterminated these animals in many parts of the country. The canine disease again appeared in epidemic form in 1931, when the cattle epidemic was subsiding. During this time there were very few cases of rabies among human beings. Since the subsidence of the epidemic, at the height of which cattle traders were losing 25 to 30 per cent. of their stock, the disease had remained in the country in sporadic form.

FEVER HOSPITAL PRACTICE

At a meeting of the Fever Hospitals Services Group of the Society of Medical Officers of Health at the House of the Society on November 29th, Dr. E. H. R. HARRIES, medical superintendent of the North-Eastern Hospital (L.C.C.), delivered his presidential address on fever hospital practice in retrospect and prospect.

He said that the primary purpose of the municipal fever hospital in the past had been the segregation of the infective sick with a view to diminishing the incidence of the endemic fevers in the community. Many had been built and staffed as cheaply as possible to attain what had proved to be the unattainable—namely, the reduction in the incidence of endemic infections by the segregation of a small minority of infective individuals represented by clinical cases. The great decline in the enteric group of diseases had been due to sanitation, but in scarlet fever, diphtheria, measles, and whooping-cough the decline in incidence was inappreciable. The steep decline in the fatality rate of diphtheria commenced forty years ago with the introduction of antitoxin, but the limits of decline would appear to have been reached in this disease, which was now fortunately preventable whenever the public so desired. The lessened incidence of complications in hospital-treated cases of scarlet fever was due to the natural decline in severity of type and to improved ward environment, with adequate bed-spacing. The complication rate had declined very considerably before the introduction of scarlet fever antitoxin ten years ago.

Overcrowding of wards resulted in a high incidence of extraneous pyococcal infections, and therefore in a very much lengthened average stay. Adequate bed-spacing in the open ward was essential, and the provision of adequate means of segregation of patients who constituted potential gross foci of infection. During the last few years especially greatly increased provision of isolation accommodation had been made in fever hospitals, but Dr. Harries pointed out that the necessity for this had been first shown by the administrators of the large fever hospitals a generation ago. Hospitals continued to play an important part in the social services. The range of infectious diseases now admitted was very much wider, and the possibilities of clinical services had increased very greatly. The days when special surgical procedures were undertaken by the resident medical staff had rightly gone. The attachment to large fever hospitals of specialists in other branches of medicine was the only way to secure recognition of the municipal fever hospital as a valuable clinical institution. The closer the integration of the work of the fever hospital with that of the children's hospital and the general hospital the better would it be for all concerned. Although the decline in the clinical severity of the common fevers and the sharing of special difficulties with a consultant staff might be thought to have diminished the interest of the work for the clinical resident medical officer, he had still very much to learn. No field provided a better training ground in the observation of clinical minutiae and few more numerous opportunities for investigation. One of the most important functions of the fever hospital was to make additions to the stock of knowledge of the common infections in order that they might become less common. If the work permitted statistical checking, it was important to obtain expert advice beforehand as to the collection and arrangement of data in order to avoid many pitfalls. Dr. Harries claimed that the fever service had, especially since the war, contributed its full share to the investigation of methods of specific prophylaxis, the wider application of which was the responsibility of others. Prophylaxis was not confined to specific immunization. The speaker instanced the important prophylactic work of the otologists attached to fever hospitals in the prevention of deafness and deaf-mutism; they had transformed the problem of the running ear in scarlet fever and measles. Further advances were possible, and would be achieved by team work. Another direction in which work of a prophylactic nature was desirable was the early detection, with the assistance of the radiologist, of signs of pulmonary damage following an attack of measles or whooping-cough, and the provision of machinery, already in existence in the L.C.C. service, by which children might be kept under skilled observation after discharge from the fever hospital. In conclusion, Dr. Harries expressed the opinion that many of the large fever hospitals were now adequately equipped and staffed as worthy auxiliaries to combat disease in childhood.

SURGICAL SHOCK

At a meeting of the Midland Medical Society on December 4th, with the president, Professor W. H. WYNN, in the chair, Mr. J. W. RIDDOCH read a paper on "Surgical Shock."

Mr. Riddoch said that Boise (1907) appeared to have been the first to implicate excessive sympathetic irritation. Work done during the war resulted in the toxaemic theory of shock being generally accepted, but in more recent years experiments by M. I. Smith and others rendered it untenable. Blalock had shown the importance of local fluid loss in experimental traumatic shock, but though the work of Holt and Macdonald and of O'Shaughnessy and Slome confirmed that of Blalock, they suggested that a nervous factor was also at work. It would be hard to

convince clinicians that surgical shock was in no way related to centripetal nervous influences, and the trauma employed on the hind limbs of animals was not comparable with surgical procedures. The clinical features of advanced shock were those usually referred to, but the early stages might show a rise of, or no change in, the blood pressure. Concentration of the blood had been demonstrated even at this point, and a diminution of the pulse pressure occurred. Sensory stimuli caused rises of systolic pressure; only later did the mean pressure fall and a marked reduction in blood volume occur. The causes of sympathetic activity included the unpleasant emotions, such as fear and anxiety, and pain, cold, and asphyxia (Cannon). Such factors were recognized clinically as important in producing or intensifying shock. Among the results of this activity was a rise in blood sugar. The hyperglycaemia that occurred in anaesthesia in experimental work on animals and during operations on man had usually been attributed to sympathetico-adrenal action, though some authors viewed reduction of total metabolism, depression of the islets of Langerhans, and toxic action of the anaesthetic on the liver cells as causes. In post-operative shock and in wounded men (Cannon) the blood sugar level was always found to be raised. It had been shown that the rise in blood sugar during abdominal operations under general anaesthesia could be stopped by splanchnic analgesia, when a subsequent fall occurred. This indicated that the hyperglycaemia was due to sympathetic action, and suggested that the raised blood sugar in shock was associated with sympathetico-adrenal stimulation. Sherrington and Copeman (1893) had demonstrated a local increase in the specific gravity of the blood on stimulation of the sympathetic supply to the thyroid gland, and Bainbridge and Parkinson (1907) that chromaffin tissue was absent in cases of death from post-operative shock, suggesting that there had been an intense out-pouring of adrenaline. Bainbridge and Trevan (1917) produced shock with infusions of adrenaline, and believed that a reduced blood volume ensued. Freeman (1933) with infusions of adrenaline, obtained a reduction in blood volume of 14 per cent., and this was prevented by ergotoxine. In other experiments, sham rage reduced the blood volume by 21.9 per cent., but this reduction did not occur after ergotoxine, or after previous removal of the sympathetic chains. This excessive sympathetic activity was known to occur in shock, and all the known features of shock could be produced by excessive sympathetic stimulation. The curious apathy and diminution of sensation was interesting in the light of recent work. Feng (1933) ascribed decreased sensibility, caused by injury to a piece of frog's skin, to the liberation of potassium which was present in higher concentration in the cells than the fluids of the body; D'Silva (1933 and 1934) found that adrenaline and other sympathetic stimulants produced a rise in serum potassium. This liberation of potassium might well be the cause of the sensory depression observed in the shocked state. The theory of sympathetic hyperactivity helped to explain several familiar phenomena. Pleasant surroundings and the avoidance of mental stress were desirable; no surgeon liked to deal with the over-anxious type of patient. The good bedside manner acquired a scientific sanction, and the principle of free choice of doctor had a physiological background.

Professor Seymour Barling stated that in the clinical picture of secondary traumatic shock circulatory collapse was the most noteworthy feature. The blood pressure was low, and the systolic pressure might fall to 90 or less, but this was not inconsistent with ultimate recovery. The mental condition varied: with a painful lesion restlessness persisted, and would appear to hasten the downhill progress. With the shock-like condition seen in patients dying of gas gangrene or other conditions of overwhelming sepsis, the patient might be delirious, or alert and talking, and coherent up to the moment when he lay back dead. Dale's theory of shock by the production of histamine-like bodies of a depressor type in the traumatic area had always attracted surgeons in the war: product though it was of experimental methods it has now been almost universally disproved by the experimenters; nor did it receive much support on the clinical side. Although at first it seemed an adequate explanation of the severe shock of the burnt patient, it was found that the introduction of the tannic acid method of treatment, though a notable advance and responsible for a lowering of mortality and lessening of suffering, failed to produce any lowering of mortality in the first forty-eight hours, when shock was the effective cause of death. The theory that shock was due to fluid loss into the traumatized area by exudation of plasma bleeding, independent of external blood loss, had always been satisfying to the clinician, and although at one time not supported by experimental study, as being insufficient to explain the phenomena, it had recently derived confirmation from more exact experimental research. This theory agreed with the clinical findings in the shock-like condition arising in diverse ways; it explained the circulatory collapse, and gave a rational basis for the use of known helpful remedies. In the search for an explanation of the syndrome of shock the fact should not be overlooked that more than one factor might be at work, and that in different types of clinical shock these factors might be effective to a greater or lesser degree in each type. That nerve impulses from the traumatized area might play a part in the general depression of the body vitality seemed reasonable: notable shock-producing areas were the peritoneum, the mesenteries, the region of the anus and bladder neck, and the tips of the extremities. The relation of pain to shock, its effect in prolonging and developing the condition, and the beneficial effect of anaesthetics and analgesics had always been apparent to the clinician, and would appear to support his contention that nervous influences might play a part in the syndrome.

Until recently, Professor Barling said, the treatment of shock was empirical rather than scientific; it resolved itself into the war-time measures of morphine and rest to allay pain, blankets and hot-water bottles to give warmth, and hot sweet tea to supply fluid and mild stimulation. Undoubtedly prophylactic measures applied early to prevent or diminish shock were more satisfactory than treatment of the established condition. Active treatment to deal with the fluid depletion came most satisfactorily from alimentary sources. Intravenous infusions of saline had proved disappointing. The gum-saline infusion of Bayliss was more satisfactory, and should certainly be given in the presence of a blood pressure of 90 with a tendency to fall. There appeared to be no advantage in transfusing blood except in cases in which haemorrhage had been the main factor in producing shock. Care must be taken to avoid excessive fluid loss by sweating. Active surgical treatment of the patient from whom shock was passing off was a question of practical importance. Nitrous oxide and oxygen was undoubtedly the best of the general anaesthetics, with open ether in the second place. There were definite advantages in the use of a local anaesthetic when applicable, and in head injuries especially. No support had been received for the suggestion that spinal anaesthesia might be of assistance to the surgeon.

Dr. L. T. Clarke said that ten or more years ago dietetic, psychic, and anaesthetic shock were distinguished, but the first two had now been eliminated. Shock was common when the usual prelude to an abdominal operation was a period of acute starvation punctuated by intensive purgation. The patient came to the table with his liver depleted of glycogen and his tissues dehydrated. The pre-anaesthetic sedatives in present-day use had done much to eliminate psychic shock. In the small infant there was little perception of shock, but this period of relative immunity was very brief, a matter of two or three weeks. The aged only apparently endured operations well. Squeezing of the liver was a better method of resuscitation than cardiac massage: by driving the blood towards the heart it provided the natural stimulus to contraction—namely, distension. From the anaesthetist's point of view shock occurring during operation might be due to haemorrhage, trauma, overdosage, oxygen deficiency, loss of body temperature, and the duration of the operation. An ill-chosen anaesthetic could increase bleeding. For example,

in radical amputation of the breast patients showed less shock with chloroform and oxygen than with the more stimulating ether or the more congesting gas and oxygen. Trauma must be considered in the light of a tissue destruction and nerve stimulation. The inadequate anaesthetic which failed to abolish muscle tone would cause the surgeon to do more harm than necessary. Deep anaesthesia was best, for fluctuating depths of anaesthesia invariably caused shock. In some operations nerve stimulation with resultant reflex shock could be obviated by nerve-block methods of anaesthesia. It must be remembered that the diathermy electrode provided a point of intense local stimulation, and the remedy was deeper general anaesthesia or some form of nerve block. The ill effects of partial cyanosis over a long period could not be exaggerated. A clear airway was a vital necessity. Draughts and unnecessary exposure must be avoided. A too hot theatre was as bad as a too cold one. When the patient was in a state of shock before the operation, this should be preceded by some attempt at fluid replacement, preferably by blood transfusion. The best anaesthetic in established shock was gas and oxygen ; spinal anaesthesia must be avoided, because it paralysed the vaso-constrictor nerves. The solution of all problems was to be found in careful pre-operative preparations, unfluctuating anaesthesia, and gentle surgery.

Dr. STUART MACDONALD believed that the shock-producing effects of protein cleavage substances should be considered as in intestinal obstruction and acute pancreatitis. The blood volume changes were important in shock ; 47 per cent. of the circulating fluid might be lost with a traumatized limb. The sympathetico-adrenal reaction was probably a defence mechanism in shock, and not a direct cause. The vasomotor reactions might be regarded as an effect of stimulation of the vaso-dilator centre or caused by the vaso-dilator nerves being activated by acetylcholine in traumatic shock. The final collapse might be due to failure of the vaso-constrictor mechanism to allow of adequate medullary blood supply.

Professor BECKWITH WHITEHOUSE remarked that the element of fear was often induced by remarks in the Press. The amount of trauma might be negligible and yet severe shock occur. A woman of the excitable type who read medical literature, and in whom demonstrable fear was exaggerated, made her will the day before labour. She had a perfectly normal labour, but a short time afterwards she died from fright. In gynaecological surgery a severe operation would often cause shock in an unemotional patient, but the apprehensive patient was a much more dangerous problem in regard to operative shock. Deaths in gynaecology were much more common in illegal operations, where the emotional side was great.

Dr. H. W. FEATHERSTONE defined two causes of shock in simple dental gas anaesthesia: asphyxia and pre-operative fear. The patient might be cold and clammy, and feel ill for some moments afterwards. In spinal anaesthesia acute shock and collapse occurred. The speaker wondered if the large bulk of dilute novocain solution injected in splanchnic anaesthesia caused disturbance of the liver function. In regard to the posture of the patient during anaesthesia, the Trendelenburg position was very favourable, whereas there was a real danger if the patient was on the face and the head raised. The opinion was expressed that the psychology of the black races towards surgical procedures was a favourable protection against shock.

Mr. BERNARD WARD thought that Crile's kinetic theory of shock was a very useful basis, and had profoundly modified the procedures in surgery in the attempt to avoid shock. Nerve block minimized certain changes in the brain, liver, and adrenals, which otherwise proceeded as trauma occurred. There were two important factors in shock: pain and haemorrhage. The speaker had great faith in morphine to subdue pain. Cases of retention of urine in elderly patients were instanced in which great pain had been allowed to continue, with the result that delayed shock ensued. The element of fear was certainly important in accentuating shock. Professor W. GEMMILL quoted cases of delayed shock. A boy playing football injured his humerus but continued to play, and after the game he passed into profound shock. He believed the sympathetic nervous system tended to counteract shock. The PRESIDENT suggested that there might perhaps be various syndromes of shock. In pneumonia or toxic scarlet fever a condition of circulatory failure simulating surgical shock was seen. He thought that a biochemical basis would eventually be discovered as the essential cause. Fear might start the train of events, but he doubted if it could initiate shock.

CORRESPONDENCE

Cysticercosis of the Brain

SIR,—In reading reports on possible cases of cysticercosis one cannot but be impressed by the widespread miscomprehensions which exist regarding this disease. The biological object of cysticerci while in the tissues of the intermediate host is to remain quiescent ; they may be likened to thieves who have entered some premises where they stay hidden so long as concealment is helpful to their purpose. In the same way cysticerci normally give little or no outward sign of their presence (unless crowded out by their own numbers) while they are alive, but after their death they cause symptoms by post-mortem swelling and by the liberation of toxic products of degeneration. Consequently a period of several years commonly elapses between the invasion of the body and the onset of clinical symptoms, of which the most frequent is epilepsy.

During the life of the host diagnosis for practical purposes is at present dependent on only two signs, neither of which, unfortunately, is a necessary part in the development and degeneration of the parasite—the appearance of palpable cysts in the tissues and their calcification post mortem. As regards the first there may be no cysticerci outside the brain, and even if present in muscle, etc., as well, they may be too deep for detection and excision when post-mortem swelling occurs, or so few in number as to escape notice ; or the host may come under examination only at a time when he is free from palpable cysts, although some may have been present months or years before, or may appear months or years afterwards, as determined by the longevity of individual parasites.

Calcification is found only as a form of post-mortem degeneration, and as a rule a period of about three years elapses between the death of a cysticercus and the deposition of calcium sufficient for recognition in a skiagraph. Some parasites may die off quickly, while others in the same host may remain alive for many years, and, speaking generally, a positive skiagraph can hardly be expected if the patient's nervous symptoms are of less than four or five years' duration. On the other hand, if the silent stage of the disease has extended, say, to over five years, calcified parasites might be detected somewhere in the body at the time of the onset of the nervous symptoms. It cannot be emphasized too strongly that as a rule the cysticerci in the brain do not calcify, and so cannot be seen in a skiagraph ; radiological examination, therefore, should never be limited to the skull.

For every case of cysticercosis immediately diagnosable there are a large number which will defy diagnosis for years, or which can be recognized only at necropsy. And even after death the presence of a few cerebral parasites—perhaps only one or two in all—might easily be overlooked " unless the pathologist has cysticercosis in mind, knows what to look for, and leaves no scrap of brain substance more than four millimetres square unsearched " (*Trans. Roy. Soc. Trop. Med. and Hyg.*, January, 1934).—I am, etc.,

W. P. MACARTHUR.

Royal Army Medical College, London, S.W.1.

⁂ An annotation on cysticercosis appears at page 1215.

X-Ray Treatment in Endocarditis

Sir,—Any who may wish to make a clinical trial of the suggestion of Dr. Herbert H. Brown, in your issue of November 16th (p. 970), that small doses of *x* rays might be of benefit to some patients with subacute endocarditis would find help from the papers of Drs. R. L. Levy and Ross Golden (*Amer. Journ. Roent.*, 1927, xviii, 103, and 1933, xxix, 79) on their experiences with thirty-two cases, aged from 6 to 42.

Of these patients seventeen showed definite improvement from the treatment, five losing entirely their paroxysmal heart pains. One girl of 13, who had been in hospital for nine months with no improvement in her heart signs and fever, had a normal temperature and pulse rate five days after the first *x*-ray treatment; after eighteen months she attended school again. An aortic diastolic murmur had disappeared. She had grown well during school attendance for the past five years. Another patient, aged 18, with signs of mitral stenosis and incompetence, had been incapacitated with pain and cardiac weakness. She completely lost her pain, and was able to start work two years after the first irradiation. The first case had twelve *x*-ray treatments in three courses; the second twenty-five irradiations in seventeen months.

The dosage was a 10 per cent. dose (that is, 70 to 80 *r* scattered), calculated at the mitral valve level; treatments were from front and back fields, every two weeks, till four in all; this series was repeated after some weeks or months in many cases. (*X*-ray factors: 200 kV, 50 cm. distance, 0.5 mm. Cu – 1 mm. Al filter.) Fourteen of twenty cases showed electrocardiographic changes (not seen after salicylate medication). Six types of alteration are classified. Most of the patients had rheumatic heart disease. Two patients with *Streptococcus viridans* infection showed no benefit and died.

Depth doses as low as 10 per cent. of a skin unit at intervals of a week or two could in no way damage the heart, which shows usually little or no sign of change after heavy irradiation of the chest in cases with mediastinal tumour or left-breast cancer. But in these cases tangential radiation should be used as far as possible and the heart kept from the direct beam of rays, as both experimental and clinical observations have shown that myocardial damage can result from doses in the heart muscle of 1,500 or more *r*. (See, for example, Englmann: *Fort. a. d. Geb. d. Roent.*, I, 1934, page 40 of the twenty-fifth German Roentgen Congress report.)—I am, etc.,

London, W.1, Dec. 14th. J. H. Douglas Webster.

Risk of Explosion in Operating Theatres

Sir,—The letter of Sir J. E. Petavel (December 7th) prompted me to inquire at one hospital at which I am a member of the staff as to what extent the insurance policies of the hospital cover the risks to life and property arising from an explosion in the operating theatre. It was found that the only explosive risk covered was that arising from the heating and engineering apparatus of the hospital, and there appeared to be no cover for the risk of explosion arising from the professional services of the hospital.

With the increasing trend towards the use of electrical apparatus in modern surgery there exists an increased risk of explosion in operating theatres. I therefore venture to suggest that the members of the medical committees of all hospitals would be doing a service to their institutions by ensuring that the hospital insurance policies fully cover the risk of explosion in the operating theatre, including injury or loss of life of all possible occupants (patients, nurses, honorary and salaried medical staffs, porters, students, post-graduates, etc.).—I am, etc.,

Manchester, Dec. 14th. H. K. Ashworth.

Tuberculosis Among Students and Nurses

Sir,—As the Prophit Tuberculosis Survey Scheme has been mentioned by a correspondent in your columns, it may be of interest to point out that the Royal College of Physicians is engaged, on behalf of the Prophit Trust, in a large survey scheme for the investigation of the nature and incidence of tuberculosis between the ages of 15 and 25. We have already started work on the nurses and students in six different hospitals, and the Royal College would be only too pleased to carry out a similar research on nurses and/or students in any hospital or medical school which cared to co-operate.—We are, etc.,

Dawson of Penn,
President.

Charles Newman,
Assistant Registrar.

Royal College of Physicians,
London, S.W.1, Dec. 7th.

Sir,—Under this heading various old residents have drawn depressing pictures of the miserable conditions under which hospital residents work, and so plaintively do they cry that one is forced to conclude that they did not enjoy their period of residency. Now this surprises me.

Admittedly the life of a hospital resident is not one conducive to robust health. The long and irregular hours of work in a disease-laden atmosphere will, in time, take toll of health unless definite steps are taken to introduce a little regular fresh air and exercise into the routine. It is simply up to the resident himself to take this trouble. The average house-man is notoriously careless of his physical well-being. He gets little exercise, too little sleep, and too much tobacco. He might retire to bed, emergency work permitting, at 10.30 p.m., as the night rounds can be done any time after 10 p.m. Actually he rarely does retire before the small hours, and consequently, rising hurriedly next morning at a late hour, swallows a hasty breakfast and dashes off to meet his chief.

It is usually possible to get in a weekly run. If open country is not available, we used to find the towing path of a neighbouring canal provided an excellent track. In summer it is usually possible to drag one's bed into the open air of a balcony or a flat roof. Possibly these small points were of more importance than we then realized, but certain it is that I and my contemporaries all recall those days with very pleasant memories. Nurses are in a less fortunate position. While exposed to the same dangers of health of the hospital system, they are not free agents to help themselves. It is certainly high time that much greater facilities were afforded them for open-air exercise.

As for remuneration, I have so little regard for the practical knowledge of the newly qualified that I still think 30s. weekly quite handsome payment during the period of trying oneself out on the suffering public.

With rather more relevance to the title of this letter, I should like to support Dr. Gregory Kayne's suggestion that sanatoria should be started in this country on the lines of the "Sanatorium des Etudiants" in France, where it would be possible for students to continue their studies while undergoing treatment.—I am, etc.,

Tamworth, Dec. 15th. P. W. Parkes, M.R.C.S.

Cardiac Resuscitation

Sir,—In your issue of October 19th a letter by Dr. A. Goodman Levy encourages me to send you a copy of a short record of "A Case of Chloroform Syncope: Intra-abdominal Compression of the Heart: Recovery," published in the *Transvaal Medical Journal* (May, 1906).

This must, I think, be one of the earliest records of a case in which recovery was complete and not merely temporary, and it also bears out Dr. Goodman Levy's

contention that cardiac massage should be carried out at the earliest possible moment following cardiac failure and synchronously with artificial respiration.

The usual means of resuscitation of a patient from grave chloroform syncope are by no means always satisfactory or successful. The number of cases recorded in which direct cardiac compression has been resorted to is small; hence the case now described may be of some interest.

The patient was a man about 25 years of age, who had had many attacks of appendicular colic during the past two years. He was operated upon during a quiescent period. In every other respect he was apparently perfectly sound.

Chloroform was given on a Skinner's mask in the usual way. Anaesthesia was easily and quietly induced, and the operation proceeded with. The appendix was readily found, but was fixed deeply in the pelvis by adhesions. Some straining now took place, and, as a result, some omentum began to roll out of the wound. I told the anaesthetist I would wait till the patient was more fully under. More chloroform was given, and in about a minute the straining ceased and the operation was proceeded with. A few minutes later respiration ceased suddenly, and the anaesthetist began artificial respiration, and a few seconds later injected strychnine. The ingress and egress of air into the lungs was perfectly satisfactory, but no voluntary movements took place. The patient was deeply cyanosed, livid, and pulseless. No heart sounds were discernible. The situation was desperate, and I felt convinced the patient would be lost. I therefore, as a last resource, passed a hand into the abdomen through the operation wound, and up to the diaphragm on the left side. There was no cardiac movement whatsoever. On resuming artificial respiration the heart was forcibly compressed against the fingers in the abdomen, making counter-pressure on the diaphragm and ventricles. Within a short time respiration and cardiac action were re-established, the operation was proceeded with, the appendix removed, and the after-history was uneventful. Artificial respiration, tongue traction, and the injection of strychnine had all been tried, but without avail. Injection of strychnine when the heart had completely failed, as in this case, is obviously useless, unless possibly it is injected directly into the heart muscle.

The case was one clearly of overdose of chloroform, and in this the anaesthetist concurred.

I saw another case of cardiac failure from overdose of chloroform in 1895, the patient being a child of about 9 months. Here, all other means having been tried, forcible pummelling and kneading over the cardiac region produced the necessary mechanical stimulation of the heart, and recovery in what looked like a hopeless case ensued. Here the flexibility of the infant's thorax contributed largely to the success of the manœuvre.

—I am, etc.,

H. TEMPLE MURSELL,
M.B., F.R.C.S.Ed.

Johannesburg, Nov. 19th.

Inexpert Radiography

SIR,—In the main the argument in this question seems to settle out on the line of how far the process of "expert" or specialist decentralization may reasonably be expected to go. Is there, indeed, any limit to the extent to which the pampered modern (by virtue of what personal merit or desert, economic or otherwise, remains discreetly out of the discussion) may expect to have the products of enlightened human effort delivered on his own doorstep? The L.C.C. at present offers a strong and valuable demonstration against the tide of decentralization in its policy of concentration for the treatment of special conditions; and the successful activity of such an important adumbration of a State medical system is by no means to be overlooked. It must be obvious that any attempt to include in miniature all the services available in the large general hospital in each and every small hospital is grotesquely uneconomic, particularly in view of the speed and ease of transport and the relatively great rarity of the real emergency.

Of one main issue raised in the correspondence there can, of course, be no doubt: a vast number of radiographs one sees suggest nothing so much as the activities of an irascible cuttlefish, equally so the resultant obfuscation. It should be obvious that to attempt interpretation of an obscure *x*-ray film must be more hazardous than dependence on the most difficult clinical observation. Good radiographs mostly need no interpretation; they tell their own tale, and for the purposes of help in the diagnosis of the majority of visceral diseases none but the highest-grade *x*-ray photograph is other than a hindrance, or worse. The energetic commercialism of the manufacturers of radiographic plant may have had something to do with the impression that radiography is a process comparable to holiday snapshot photography. It is, however, surely no obscurantism to protest that there is a limit to versatility, though no doubt it is gratifying to feel there is nothing one touches but one adorns it!

The reliance, unless strictly qualified, on study for a diploma in radiology appears fallacious; apart from being instruction in *x*-ray technique, is this to be held a course in anatomy, physiology, and pathology, endowing with esoteric knowledge, beyond that possessed by the ordinary clinician? In the idea of creating a completely separate entity, radiographic interpretation can add only a further obstacle to the homogeneity and equivalence in factors the assessment of whose relative value offers already the main difficulty in diagnosis.

The famous Cave analogy in the *Republic* represents all human cognition as similar to that obtained by chained, shackled beings in the depth of a long cave, on to the far wall of which the light from a fire near the entrance is shining. The passers between the fire and the cave cast their shadows on the wall, and thus only are known to those in the depths. So perhaps radiology. The radiologists in their caves, faces directed to the wall, see shadows variable, foreshortened, distorted and blurred, two-dimensional, and interpret them through a sight-verbal association. The radiologist who sees, let alone feels, the structure, the "thing-in-itself" he attempts to visualize, is a great rarity. Indeed, the fatuous platitude, "The radiologist must be a clinician," is achieved only when the clinician is his own radiographer—for example, by some thoracic physicians: it is otherwise impracticable of realization. At the risk of execration one is forced to suggest that the *métier* of the radiologist is his demonstration of the anatomy and physiology of the patient, and that so far as he is concerned interpretation is mainly concerned with delimiting the scope and fallacies of the method of demonstration—instead, as is too often the case, of posing as the last infallible court of appeal, and, still more to be regretted, giving dogmatic diagnosis to the patient before the radiograph has been considered in balance with the other evidence.

After this seeming irrelevance I return to the main subject of my letter, which is the question of how the interpretation of *x*-ray photographs is to be acquired by the general practitioner, the answer being, of course, that it is like growing asparagus—you start five years ago! Special courses in radiology are not required except to impart such a reasonable degree of knowledge of technique as to give some idea of possibilities and restrictions. The learning of the *x*-ray signs of disease is an object of the normal medical and surgical ward teaching, equally with the anamnesis and the demonstration of physical signs and other ascertainable data. There is nothing to replace the personal insight of the clinical teacher into the learner's difficulties and consequent correction of misleading viewpoints and methods of thought. As before protested, it is here, and not in a segregated course, remote from the other aspects of the case and divorced

from pathology, anatomy, and physiology, that *x*-ray appearances should be taught.

No doubt correspondents may derive much help from the perusal of radiographic atlases, although these have yet to present the subject from the fundamental aspect such as that in which cellular pathology, for instance, stands to medicine or surgery. But, above all, first quality radiographs must be insisted on.

Does the foregoing imply that every general practitioner must be an expert in radiological interpretation? A reference to analogous subjects will show the question does not need answering.—I am, etc.,

London, W.1, Dec. 10th. C. JENNINGS MARSHALL.

SIR,—I have read with interest the correspondence under the above heading in your last three issues, and should like to be permitted to add a few comments.

Mr. Bertwistle states that the visiting radiologist to a hospital in an outlying district has no time "to read a single clinical note." I venture to suggest that the time can be made available, but that the opportunity is frequently lacking. In the case of an in-patient there may or may not be ward notes to which reference can be made; the out-patient, alas! is apt to be told merely to "go and be *x*-rayed," and upon the radiological department is placed the onus of ferreting out the clinical history, of which, as pointed out in Mr. Bertwistle's previous paragraph, "the man who examined him or sent him is fully cognizant." I think I am safe in saying that all radiologists suffer in greater or less degree from this strange shyness of some of their colleagues to transfer information which may be vital to the sound interpretation of the radiological findings, an endeavour which, even to the man who spends his professional lifetime on the subject, is apt to be beset with pitfalls. To jot down the bare essentials would occupy but a few moments of the time of the clinician; surely a small matter compared with the time of the so transient radiologist (and of the patient) while the history is being probed all over again, and a still smaller one in comparison with the risky alternative of a mere "interpretation" of radiographs, even with the addition of notes taken by a well-meaning but clinically unqualified radiographer.

Failure to provide clinical notes is sometimes due to laziness, but more often to lack of appreciation of the reasons for their provision. Occasionally, however, it is a sign of what may be termed the ignorance of inadequate knowledge, and in these cases it will be found hand in hand with indifference to, or even intolerance of, the radiologist's report. The "all-I-want-is-the-pictures" outlook is a real menace to patient and to progress, and if it could be eradicated the snapshot radiographer would automatically die out through lack of support, the medical dabbler in radiology would restrict his efforts within the confines of utility and experience, and the non-radiologist practitioner would examine radiographs with the idea of aiding, not airing, his knowledge. The last remark is made with no disrespect to the many, but as a warning to the few. Such a state of affairs involves appreciation of the scope and difficulties of radiology as a branch of specialized medicine, and recognition of the entity and status of the radiologist. It would inevitably raise the standard of radiological knowledge throughout the medical profession, and would lead to the provision of an adequate supply of trained and experienced radiologists from those who, pre-armed with clinical experience, would specialize in the subject with the best results.

One more word or warning, prompted by Dr. Howard Owen's letter. An *x*-ray apparatus can now be rendered "shock-proof," but not fool-proof, in either sense of the word. Technique, if simplified as to "button-pressing" gadgets, is by every advancement of our knowledge made still more exacting (vide Lord Horder in the *Practitioner*, and in addresses to learned societies). Academic knowledge, though sometimes tedious of acquirement, should still be required of the specialist in any branch of medical science. A higher standard should be aimed at, not a lower.—I am, etc.,

Worthing, Sussex, Dec. 9th. R. BOULTON MYLES.

SIR,—I consider Colonel Elliot was too hard in his remarks on dental radiology; the best series of teeth I have seen were prepared by a radiographer, for which body of workers I have the greatest respect. Dr. Hernaman-Johnson's well-considered letter is most encouraging. Whilst pointing out the difficulties of post-graduate teaching he does not consider them unsurmountable. The student's curriculum affords no possible opportunity; it is filled to overflowing already, but short intensive courses of perhaps a fortnight could be organized for post-graduates. The first step would have to be the establishing of a museum where prints, descriptive and clinical notes, together with post-mortem or post-operation specimens, could be viewed. The day when practitioners become *x*-ray minded will be a great one in the cancer campaign. The alimentary tract is eminently suited to study by radiology, and is in most of its parts accessible to the knife; yet how many practitioners could give the *x*-ray appearances of so common and so important a condition as gastric cancer?

I have nothing but the greatest admiration for those like Dr. Howard Owen, who, following in the steps of Sir James Mackenzie, use their plant in the same way as the physician uses his stethoscope or ophthalmoscope, to give precision to their diagnoses. They labour under grave disadvantages, but their intimate knowledge of their patients enables them to make magnificent diagnoses. From such workers come real advances in the science.—I am, etc.,

A. P. BERTWISTLE, F.R.C.S.Ed.

London, W.1, Dec. 8th.

SIR,—The present-day prevalence of inexpert radiography is rapidly bringing the whole subject into disrepute and the radiological specialist to the verge of bankruptcy. The causes are not difficult to find, and are four in number:

1. The unqualified radiographer, generally with ancient second-hand apparatus, who is not only extensively patronized by orthopaedic surgeons but who is permitted to advertise in nearly all the medical journals. Most orthopaedic surgeons would be far from pleased if practitioners constantly referred patients to unqualified bone-setters, yet they themselves appear to have no scruples in employing unqualified radiographers. Only a few days ago I was asked by a firm of solicitors to report on a set of films taken by an unqualified radiographer and showing a most blatant *pied forcé* which had been missed by both the orthopaedic surgeon and the radiographer. The disgruntled patient, be it noted, was suing the surgeon and not the unqualified man.

2. The "super-specialist" who confines his activities exclusively to one system, and who himself *x*-rays all his patients. From the patient's point of view he is probably the most dangerous of all, for he seldom fails to detect a lesion even in the most normal subjects. I know of one unfortunate man who spent three months in a private sanatorium on the strength of a normal pulmonary artery seen "end-on" in a badly centred film, and mistaken for a T.B. focus. Bad technique can easily make a healthy chest look tuberculous, and it is not much compensation to the patient to know that the film was taken by a distinguished physician.

3. General practitioners with toy sets which, while they may be adequate for the diagnosis of fractured phalanges, are all too frequently employed in the most inexpert manner for work which is far beyond their capacity. The manufacturers are largely to blame for this, as their salesmen almost invariably assure the innocent purchaser that these miniature sets can "tackle anything."

4. The surgeon who sees a patient in private, sends him to a hospital to be *x*-rayed, and then admits him to a nursing home for operation. This far from honest practice is much more widespread than is generally supposed, especially among younger surgeons.

The solution of these problems does not lie with the radiological specialist; it depends simply on our receiving honest dealing and fair treatment at the hands of our medical and surgical colleagues.—I am, etc.,

December 14th. M.D.

Calcium and Gold Therapy

SIR,—I was interested in Dr. Williams's article on the prevention of reactions in the gold treatment of rheumatoid arthritis by the use of calcium. I can confirm his results. I have, however, used calcium gluconate by mouth in 10-gram doses, sometimes intramuscularly in 1-gram doses, and as I stated in my article in the *Practitioner* of June, 1935 (p. 788), I found that calcium gluconate and liver extract with collosol sulphur at night in drachm doses lessens the risk of reaction.

It is interesting to note that in patients who are subject to allergic disorders these reactions are more likely to occur, and those with high eosinophil counts tend to be less tolerant. For such patients we have used, for the last two years, calcium gluconate as a routine adjuvant to gold therapy.—I am, etc.,

London, W.1, Dec. 7th. GERALD SLOT.

Voluntary Euthanasia

SIR,—When Dr. Millard writes that voluntary euthanasia is not a medical question he states a truth which may be wider, and wiser, than he intends. Is there any good reason why we, who have been trained and continue to train ourselves as the adversaries of death, should be forced to become his allies? The onus of executing patients belongs elsewhere. A suggestion, which has the merit that its adoption would strip this question of some of the sentimentality which now enwraps it, is that the task should be delegated either to the hangman or to some official appointed *ad hoc*. Any person with a modicum of intelligence could be speedily trained in toxicology to a degree of proficiency adequate for the task. Should the practice gain general favour it might become possible in course of time to establish abattoirs, each with its whole-time staff, in all large centres of population. Further research directed towards the discovery of cures for what the infallibles call incurable diseases would gradually become redundant.—I am, etc.,

London, S.E.21, Dec. 14th. DONALD M. O'CONNOR.

Migraine

SIR,—A patient who had been sent to me because of severe attacks of migraine felt an attack coming on as I was doing a retinoscopy. I immediately examined the fundi and watched the retinal veins dilate. If this condition were not due to increase of intracranial pressure of some kind, on what grounds could it be explained? Is it not reasonable to suppose that there is a rise of intracranial pressure, which is followed by a fall before the attack passes off?—I am, etc.,

Wanstead, E.11, Dec. 14th. FRANCIS E. PRESTON.

Obituary

WALTER SYDNEY PERRIN, M.CH., F.R.C.S.

Surgeon to the London Hospital

As announced in last week's *Journal*, Mr. W. S. Perrin died after a short illness, on December 8th, at the early age of 53.

Walter Sydney Perrin was educated at the City of London School and at Caius College, Cambridge, where he had a brilliant career, taking first-class honours in both parts of the Natural Sciences Tripos in 1903 and 1904. He was also awarded the University Walsingham Prize Medal and the Shuttleworth Research Studentship at Caius. After working for several years at protozoology Perrin decided to enter medicine, and studied for this at the London Hospital. He qualified M.R.C.S., L.R.C.P. in 1912, during which year he won the medical and surgical scholarships at his hospital; two years later he was awarded the triennial Jonathan Hutchinson Prize for an essay on intussusception. He obtained the F.R.C.S. in 1913, and the M.Ch.Cambridge in 1914.

During the war Perrin was for a short time in command of the Belgian Field Hospital at Furnes, and later became surgical specialist in the R.A.M.C., with the rank of major. In 1921 he was appointed assistant to the London Hospital, and in 1928 became a full surgeon. Among his various activities he examined in surgery at Cambridge, was president of the Subsection of Proctology of the Royal Society of Medicine, and was on the surgical staff of the Royal Masonic Hospital. Some eighteen months ago he was invited to serve on the Board of Electors to the chair of anatomy at Cambridge.

Perrin was a surgeon's surgeon. The care with which he investigated his cases, his sound judgement and skill, the kindly sympathy and patience with which he treated his patients, brought him a reputation which may be estimated by the frequency with which his colleagues sought his advice for their relatives or themselves. Ever alive to surgical progress, he weighed each new theory or practice in the scales of a cautious criticism based on wide experience, and adopted always what he found to be good.

Generations of students owe a great debt to Perrin, for in his early days he acquired a brilliant reputation as a successful coach. When he was compelled for financial reasons to abandon his career in zoology, to the loss of that science, he supported himself and paid for his medical fees by coaching in various subjects, and those who have had an easier path may gauge the courage and hard work that made this possible. He carried on his classes at Cambridge for several years after he had gone down. At the London Hospital many had cause to be grateful for his teaching in anatomy and physiology, and later in surgery. His retentive memory, his grasp of any subject he studied, and his extraordinarily clear and simple exposition, illustrated by skilful draughtsmanship, smoothed away the difficulties of his students and impressed essentials on their memory. His kindness to students beginning surgery on his firm will long be remembered by those who experienced it.

Highly cultured, with an extensive knowledge of literature and art, he was a charming friend, and those who knew him best will remember him above all for his personal qualities. The soul of honour and the most loyal of colleagues, Walter Sydney Perrin leaves behind him the memory of a trusted and lovable friend. He is survived by his widow, two sons, and a daughter. H. L.

Mr. CLIFFORD DOBELL, F.R.S., writes:

After taking his B.A. degree Perrin decided to study protozoology, in which he was encouraged by Adam Sedgwick, who was then still reader (though acting as professor) of zoology at Cambridge. To prepare himself for this, Perrin wished to work in Berlin under Fritz Schaudinn, who was then at the height of his fame and regarded as the greatest living authority on the protozoa. But he was unable to do so for various reasons, and went instead to study under von Prowazek (who was a personal friend and great admirer of Schaudinn) at the Zoological Station at Rovigno on the Adriatic (in Istria, then Austrian territory). Perrin worked here during the winter 1904–5, and for a part of 1905, altogether for about a year, and became deeply interested in the works of Schaudinn and von Prowazek, whose speculations greatly influenced all his own researches in protozoology. He was able to continue these because he won the Shuttleworth Research Studentship (Caius College) at this time; while in 1905 he also gained the Walsingham Medal (Cambridge University—for research in biology), which carried with it £20.

On his return to Cambridge Perrin was appointed demonstrator in zoology (under Sedgwick) and continued his researches in protozoology during 1906, 1907, and part of 1908. He also kept himself by coaching in the evenings. At this date (1906–7) he was a fully qualified zoologist, with special knowledge of the protozoa. He had no thought of undertaking any medical work, and his future at Cambridge looked bright. He had already made a fine beginning as a protozoologist, with several intriguing publications to his credit. He was a University demonstrator, with a small coaching practice to eke out his salary; and he was enthusiastically pursuing his researches in the intervals between teaching. All he needed to consolidate his position was a Fellowship at his College (Caius). But although he put in for this every year possible, with every prospect of success, he failed to obtain one. After his last attempt in 1907 he was thus faced with the alternatives of continuing independently as a zoologist and supporting himself by coaching and demonstrating, and with little chance of advancement, or he could abandon the career on which he had embarked so successfully and take up another. He had no money beyond what he had gained by his own labours, and had already enjoyed all the scholarships and prizes which were available. He faced his zoological defeat with astonishing courage and composure, and resolved to take up medicine as a career. Domestic troubles at this time made it imperative that he should earn more money, and this was the factor which really determined his action—as I well remember. Accordingly he relinquished all hope of continuing as a zoologist and began to study for his first M.B. examination. He got through easily, of course, and coached other candidates simultaneously. He then tackled the more difficult proposition of the second M.B. and solved it in the same way. He qualified in 1912, as a result of almost incredibly strenuous labours divided between Cambridge and London.

After 1908 I saw very little of Perrin, though we met and corresponded occasionally. Our ways diverged, and he who was, by first intention, a zoologist became a medico; while I, originally a medical student, developed into a zoologist. At the cross-roads we made contact for a year or two, and we worked side by side in the same small laboratory, on the friendliest terms, as keen students of the protozoa during 1906 and 1907. I have no doubt at all that Perrin would have made his mark as a protozoologist if he had been able to continue his work. Indeed, it is no exaggeration to say that he could have carved out a permanent niche in his own honour in almost any corridor of the Temple of Science. He had great natural gifts as a learner and teacher, when a young man, and by applying them he was able to surmount difficulties which would have annihilated most other men.

When he was a protozoologist Perrin published five papers, of which only two ("Researches upon the Life-history of *Trypanosoma balbianii* Certes," *Arch. Protistenk.*, 1903, vii, 131, and "Observations on the Structure and Life-history of *Pleistophora periplanetae*, Lutz and Splendore, *Quart. Journ. Microscop. Sci.*, 1906, xlix, 615) are really noteworthy: the others were preliminary notes. But he did a great deal more work than these papers reveal, and most of his researches on the protozoa were neither finished nor published. I am confident that he could have accomplished great things as a zoologist if fate had been kinder to him.

Professor WILLIAM WRIGHT writes:

I feel there is nothing for me to add to what has already been said about my old friend and former assistant, unless it be a reminiscence—a reminiscence which recalls what we know to have been his constant if unexpressed attitude to life; a reminiscence which may be said to contain within it his last message and instruction—he was ever a teacher—to that great multitude of former pupils scattered over the face of the earth who at Cambridge and the London Hospital had at one time or another come under his inspiring influence. Only a few weeks before he died he wrote, asking if I could tell him where the following lines were to be found:

> The common problem, yours, mine, everyone's
> Is—not to fancy what were fair in life
> Provided it could be—but finding first
> What may be, then find how to make it fair!*

—a problem which he attacked with indomitable and persistent courage from his earliest youth, and which few, I imagine, ever succeeded so satisfactorily in solving. I have, however, sometimes wondered in these last sad days if his inquiry had not a deeper meaning and purpose than I at the time appreciated; if, in the quotation, he had not found a "rod and staff" which were to guide and comfort him as he walked through the valley of the shadow, for as we now know he was for a long time conscious of the serious nature of his illness. It is not, however, on so gloomy a journey that we shall think of him, still less as lying in that *perpetuus sopor* of which the Latin poet writes; rather shall we see him on the "farther shore," with that smile we remember so well—head a little on one side—waving us a cheerful farewell, ere turning sharply on his heel he steps forward, resolutely we may be sure, on the path which all that lives must ultimately tread.

ROBERT ARTHUR ASKINS, M.A., M.D., D.P.H.

Principal Medical Officer, Southern Rhodesia

The tragic death of Dr. R. A. Askins, principal medical officer to the Government of Southern Rhodesia, while returning to South Africa, has deprived two continents of a well-known and distinguished figure in public health. His untimely death is particularly mourned in Bristol, where he had many friends and had lived and worked, first as school medical officer and later as medical officer of health of the city, port, and school service.

* Robert Browning: *Bishop Blougram's Apology.*

Robert Arthur Askins was born at Clonmore, County Carlow, Ireland, in 1880. He received his medical education at Trinity College, Dublin, and graduated M.B., Ch.B., B.A.O., at Dublin University in 1907, with first-class honours and first place in the final medical examination. Later he gained the Cambridge Diploma in Public Health and the M.A. and M.D. at Dublin University. He was also a barrister-at-law of Gray's Inn. After spending some time in gaining clinical experience, he turned to public health, and in 1908 was appointed assistant medical officer of health for Merthyr Tydfil. From 1909 to 1914 he served as assistant medical officer to the Lancashire Education Committee. In 1914 he went to Bristol as the first full-time school medical officer under the Bristol Education Committee. He soon showed himself to be an able administrator and a capable leader, and the development of the school medical service in Bristol is a lasting tribute to his organizing ability.

During the great war he served with the British Expeditionary Force (1915–19) as specialist sanitary officer with the rank of captain R.A.M.C.(T.), and was mentioned in dispatches. He returned to his former post as school medical officer at the end of the war, and in 1924 was appointed deputy medical officer of health for the city. On the retirement of Dr. D. S. Davies in 1928 he was promoted to be medical officer of health, in addition to retaining his position as school medical officer, and for the first time the two services became co-ordinated under one head. He was also appointed lecturer in public health at the University of Bristol. Great changes were occurring in local health government during these two years, and Dr. Askins was actively engaged in preparing the way for the reorganization in accordance with the Local Government Act when in May, 1930, he resigned his post upon his appointment as principal medical officer to the Government of Southern Rhodesia. He had joined the British Medical Association in 1908 and served on the Representative Body at the Annual Meeting at Bath in 1925 ; in the following year he was chairman of the Bristol Division.

In public life Dr. Askins was much respected for his ability and his determination. To his friends he was known to be of a shy and retiring disposition. He was extremely fond of simple rural life, and whenever his duties permitted he sought the company of the Somerset and Gloucester Hills. He leaves a widow and two young children, with whom deep sympathy is felt by all his colleagues and friends.

R. L. WILLCOX, M.R.C.S.

Dr. Robert Lewis Willcox, who died recently at the age of 89, was an outstanding figure among the practitioners of Wiltshire. He practised for forty-four years at Warminster, and had been a member of the British Medical Association for sixty-two years, holding office as president of the Southern Branch in 1906. Domestic trouble, owing to the loss of his son, who helped him in his practice, and a severe attack of enteric fever, which left its mark on his health, caused his retirement from practice, and he migrated to Salisbury in 1914. He qualified to practise his profession in 1867, carrying out his studies at King's College Hospital, where he worked in the early days of Listerian principles, being actually house-surgeon to Lister. He went to Warminster in 1870, and while there gained great popularity, by his personality and skill, amongst all classes, and his advice was sought far and wide by practitioners in the district.

I became intimately acquainted with Dr. Willcox during the last twenty years of his life, and gained much from his help and sound advice. I was always struck by his profound knowledge in matters quite beside the actual practice of his profession, such as entomology, comparative anatomy, botany, and materia medica. He was a general practitioner in the very highest sense of the term, and although surgery in his time had not worked out the technique of to-day, he was ready to do all the major operations of those days. He was equal to any emergency, and those who sought his advice benefited not only by his great clinical experience, but also by his definite dictum when he knew what advice was right to offer. He was distinctly forcible and definite in his opinions, and I think he was generally right. He was a man absorbed in his profession, and up to the last he kept his interest in the medical papers and what was happening in the medical world. I do not think he ever had a real holiday ; the only time he left his work was when he had enteric fever, and when his son was severely wounded in the early part of the great war and he went to see him in France. He had an immense practice in Warminster and the district around, but his intense wish to do what he could for his patients far outweighed any desire for material gain. If Willcox had worked in a large urban district, where he would have had fuller scope for his ability, he would have risen to greater heights still in his profession, for he was a man of outstanding keenness, and always ready to imbibe all that was helpful in his work. My chief regret is that I did not know him when at his best, and see more of his practical and clinical work.

E. T. FISON.

HAROLD PRINGLE, M.D., F.R.C.P.I., F.R.C.S.I.

Dublin

The death occurred on December 7th of Dr. Harold Pringle, late professor of physiology and King's professor of the Institutes of Medicine in the University of Dublin. Born at Clones, Co. Monaghan, he belonged to a distinguished family, whose names are well known in professional circles, while his cousin, Mr. Seton Pringle, is President of the Royal College of Surgeons in Ireland. Educated in Dublin University, he gained the M.B. and B.Ch. degrees in 1899, and shortly afterwards the Fellowship of the Royal College of Surgeons in Ireland. After a brief period in general medicine he was appointed to the staff of the physiology department of Edinburgh University, and joined the distinguished band of assistants to Sir Edward Sharpey-Schafer, many of whom have since occupied chairs in various parts of the world. Histology was the special subject of Dr. Pringle, and his skilful technique in the handling of histological material has since impressed generations of students. During the war he served as a major, R.A.M.C., and in 1919 succeeded Sir William Thompson as King's Professor of the Institutes of Medicine in the School of Physic of Trinity College, Dublin. This appointment was associated several years later with the new chair of physiology in the University of Dublin, and both positions were held by Dr. Pringle until the present summer, when ill-health necessitated his retirement.

His original work included many histological subjects, and was published mainly in the *Quarterly Journal of Experimental Physiology*. At Heidelberg, in conjunction with Kossel, he also carried out investigations on the simpler proteins. Subsequent research in Dublin was interrupted by failing health, and is left in incomplete form.

Behind a retiring disposition Dr. Pringle concealed a remarkable combination of academic attainments, administrative ability, and strength of character. As a member of the Board of Trinity College his shrewd judgement and fearless decisions were invaluable in times of crisis. His sympathies, however, always lay with his students, whose teaching he regarded as his main duty and whom he was

ready to help with never-failing patience. His courteous consideration for his assistants and laboratory attendants has resulted in a department of extreme efficiency and smoothness in running. His Dublin house was a Mecca for physiologists, who retain vivid memories of his generous hospitality. In addition to his work, his numerous diverse interests included horses, golf, Persian rugs, antique furniture, and glass. As a connoisseur of antiques his assistance was often sought by his less expert friends, whom he was always ready to help. In later years, against a background of declining health and an overwhelming series of family tragedies, he stood out as a heroic figure with spirit undaunted. To a world-wide circle of friends Dr. Harold Pringle will long be remembered as a physiologist, as an administrator, but, above all, as a man of courage and sympathy.

Dr. ROBERT NESBITT, who died as the result of an accident on November 26th, was a well-known figure in Sutton-in-Ashfield for over half a century. In addition to his large practice he played a prominent part in local affairs, and at the time of his death was the chairman of the Mansfield bench of magistrates. Born at Corglass, Co. Monaghan, Ireland, on September 8th, 1855, and educated at Ballybay, he entered the Ledwich School of Medicine in Dublin, becoming L.R.C.S.I. in 1876 and L.R.C.P.I. in the following year. After serving as house-surgeon in the County Monaghan Infirmary for three years he bought a partnership at Sutton-in-Ashfield. With the growth of the town his practice increased, and at one time he held more medical appointments than any other practitioner in England. Shortly after he went to Sutton he was appointed medical officer of health, an office which he held until he retired from practice in 1927. He was district medical officer and public vaccinator; certifying factory surgeon; surgeon to the Post Office, the railway companies, and various local collieries; and medical referee to the Notts Miners' Association and the Prudential and other insurance companies. Notwithstanding these many appointments he found time to devote to public affairs. A justice since 1894, he was chairman of the local tribunal during the war, and was enrolled as a special constable. He was also a member of the County Standing Joint Committee and of the Panel and Insurance Committees. A member of the B.M.A., he was chosen as chairman of the Nottingham Division in 1924, and he acted as the Division's representative at the Annual Representative Meeting from 1929 to 1934. Dr. Nesbitt is survived by his wife, a son, and three daughters.

We regret to record the death on December 6th of Mr. HENRY WALTER PIGEON, at his home in Bournemouth, where he had resided since his retirement from active practice some sixteen years ago. He was born at Bristol in 1859, and from Clifton College went to Christ's College, Cambridge, where he graduated M.A., M.B., B.Ch. in 1880, after studying medicine at Guy's Hospital. He obtained the diploma of F.R.C.S. in 1885. His interests were always in general surgery, and after resident appointments on the surgical side at Guy's, and later at the Manchester Royal Infirmary, he went into consulting practice at Hull in 1886. For many years before his retirement he was the senior consulting surgeon in the Hull area. He was appointed assistant surgeon to the Royal Infirmary in 1886, becoming full surgeon in 1900, and consulting surgeon on his retirement from the active staff in 1919. Mr. Pigeon had been a member of the British Medical Association for over fifty years, and in 1897 was president of the East Yorkshire and North Lincolnshire Branch. He had many interests apart from his surgical work. Whilst in Hull he was churchwarden at Holy Trinity Church, and was for some years president of the Hull Literary and Philosophical Society. He leaves a daughter who was formerly on the staff of the Children's Hospital, Hull, and is now attached to a hospital in Palestine. His death will be deeply regretted both in Hull, where he is still remembered, and in Bournemouth, where he had made his home during his years of retirement.

Dr. LAURENCE CRAIGIE MACLAGAN-WEDDERBURN died at North Berwick on December 7th. He was the second surviving son of Dr. A. S. Maclagan-Wedderburn, and was educated at Forfar Academy, University College, St. Andrews, and Edinburgh, where he graduated M.B., Ch.B. in 1899, proceeding M.D. in 1906. His first appointments were those of resident surgeon to the Royal Maternity Hospital, Edinburgh, and resident surgeon and physician consecutively to the Royal Infirmary. He then went out to South Africa, and held a commission as civil surgeon in the South African Field Force. During the late war he served first in the R.A.M.C. with a commission as temporary captain; then he transferred to the Royal Navy with the commission of temporary surgeon, and finally was appointed a squadron leader in the R.A.F. Medical Service, being subsequently promoted to major in the Air Force. He had acted as Admiralty surgeon and agent in North Berwick, to which he returned eventually to continue his private practice. He was parochial medical officer to the parishes of Whitekirk and Tyningham, Stenton and Whittinghame, surgeon to the Post Office at Prestonkirk, and medical referee to the Prudential Assurance Company. His recreations included sailing, golf, and shooting. He had been a member of the British Medical Association since 1911.

The following well-known foreign medical men have recently died: Dr. LUIZI MARIANO PATRIZI, professor of physiology at Bologna, aged 69; Dr. EUGÈNE RICHARD, professor at the medical school and mayor of Rouen; Professor ALBERT MAIRET, formerly dean of the Medical Faculty of Lyons, aged 62; Dr. PAUL EISLER, emeritus professor of anatomy at Halle University, aged 73; Professor HUBERT PROHASKA, director of the Psychiatric and Neurological Institute at Brunn; and Professor C. VON TYSZKA, the Hamburg medical statistician, aged 62.

Universities and Colleges

UNIVERSITY OF OXFORD

The following medical degrees were conferred at a congregation held on December 14th:

B.M.—R. N. B. Cridland, H. N. Davis, B. B. Hickey, P. E. Cresswell, F. G. Ward, E. C. O. Jewesbury, W. P. Mallinson, H. Fidler.

UNIVERSITY OF LONDON

A. Meyer has passed in Part I of the examination for the Academic Post-Graduate Diploma in Medical Radiology.

The following candidates have been approved at the examination indicated:

THIRD M.B., B.S.—*‡S. O. Aylett, *‡Joan W. Ellinger, *†Mary F. Lockett, R. M. H. Anning, C. G. Baker, T. L. S. Baynes, E. R. Bennion, Katherine M. Blenkin, C. J. F. Blumenthal, P. R. Boucher, Muriel G. Boycott, P. E. G. Clements, J. G. Clothier, J. H. Cobb, E. C. Cordeaux, R. Cox, J. V. Dacie, D. V. Davies, D. G. ff. Edward, J. A. C. Franklin, L. D. B. Frost, B. M. Goldsworthy, K. L. Grogono, E. A. Hardy, K. W. Hardy, D. B. Hyslop, J. D. Jenkins, H. S. Joseph, C. Langmaid, K. A. Latter, J. I. Lesh, J. Ll. Lewis, M. J. Lindsey, H. M. McGladdery, W. N. Mann, J. I. C. Mason, W. R. Merrington, T. Miles, R. L. Moody, C. J. B. Murray, H. Nicholson, W. L. Ogle, C. J. S. O'Malley, D. A. O'Reilly, G. H. C. Ovens, W. D. Park, F. D. Paterson, E. Pereira, H. N. Perkins, J. B. Phillips, F. O. Potter, W. A. Pritchard, J. D. Richardson, Jean Ross, Millicent I. Rowland, P. N. Shutte, I. Slome, B. W. Smith, J. G. Stewart, J. M. Stewart, Margaret J. Suttill, J. W. Todd, B. McN. Truscott, C. E. G. Wickham, Helen E. Wight, Sheila M. R. Williams, J. W. Wishart, A. L. Wyman, E. C. Zorab. *Group I:* G. T. Balean, H. L. W. Beach, L. C. Bousfield, F. E. Corea, A. G. Edwards, G. J. Evans, J. E. Giesen, W. H. Hamilton, D. T. K. Harris, Sylvia A. M. Herford, H. G. Howitt, L. M. Kelly, E. A. Knappett, H. A. Leggett, O. G. Lloyd, Queenie I. E. May, Elizabeth M. Morgan, F. J. Napier, S. G. Nardell, R. J. Niven,

E. P. Rigby, R. S. F. Schilling, G. R. Taylor, W. R. Welply, Rowena Woolf. *Group II:* C. Anderson, F. W. Baskerville, H. V. Brown, Kathleen E. Burnell, H. B. C. Carter-Locke, T. Denness, J. E. Elliott, W. D. F. Lytle, J. McA. McArthur, E. G. Murphy, N. W. N. Murray, K. L. G. Nobbs, Dorothy S. Pope, D. A. Prothero, J. C. Roberts, E. ap I. Rosser, H. C. Thomas, Winifred J. Wadge, A. Wardale, E. D. H. Williams.

* Honours. † Distinguished in medicine.
‡ Distinguished in forensic medicine and hygiene.

UNIVERSITY OF BRISTOL

The following candidates have been approved at the examtions indicated:

FINAL M.B., CH.B.—V. T. Baxter, Theodora M. Crabtree, J. G. Field, Irene G. Hamilton, M. A. Nicholson. *Part I, Forensic Medicine and Toxicology:* Daphne V. Dennis, R. L. J. Derham, H. D. T. Gawn, M. E. M. Herford, F. J. W. Hooper, C. R. G. Howard, C. B. Jones, Margaret E. Morgan, G. L. Page, A. N. H. Peach, *P. J. Ryan, Mabel W. N. Tribe. *Part I only:* †J. F. Ackroyd, M. Dworkis, Emily G. Hamlyn, M. M. Lewis, R. H. Owen, J. W. E. Snawdon. *In Pathology completing requirements of Part I:* A. M. Spencer.

* Distinction in materia medica, pharmacy, pharmacology and therapeutics, and forensic medicine and toxicology.
† Distinction in pathology.

UNIVERSITY OF SHEFFIELD

At its meeting on December 13th, with Colonel H. K. Stephenson in the chair, the University Council accepted with regret the resignation of Dr. Harold Leader from the post of lecturer in diseases of children, and accorded him its thanks for his services to the University.

The thanks of the Council have been conveyed to the Rockefeller Foundation, New York, for its grant of £200 in aid of research in the Department of Pharmacology.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

A Council meeting was held on December 12th, with Mr. Arthur H. Burgess, Senior Vice-President, in the chair.

Appointments

The following were elected to the four vacancies on the Court of Examiners: Mr. E. C. Hughes (Guy's), Mr. L. E. C. Norbury (Royal Free), Mr. R. Milne (London), Mr. P. H. Mitchiner (St. Thomas's).

Sir Holburt Waring was reappointed as the representative of the College on the Court of Governors of the University of Birmingham. It was reported that the President, Sir Cuthbert Wallace, had accepted an invitation to serve as a member of the General Council of King Edward's Hospital Fund for London for the year 1936.

Diplomas

Diplomas of Fellowship were granted to the following fifty-two candidates:

V. C. Snell, T. M. Tyrrell, W. R. S. Hutchinson, S. G. Browne, J. F. Jarvis, L. C. Oliver, A. K. Price, P. P. Sheth, J. Grocott, R. H. R. Belsey, L. E. Jones, V. P. Gupta, I. Magdi, B. H. Page, H. S. Shucksmith, F. A. Rundle, G. Williams, M. A. Falconer, A. S. Kerr, T. Beath, J. I. M. Black, A. N. de Quadros, W. S. Diggle, H. T. Fleming, S. R. Gerstman, L. W. Gleadell, A. O. Green, Muriel B. McIlrath, I. Mehrez, E. W. Peet, M. Z. Siddiqui, J. B. Somerset, H. K. Vernon, Doris E. O'Doherty, M. N. Chatterjee, E. W. T. Morris, W. S. Creer, J. K. Wilson-Pepper, I. W. Matheson, Dorothy A. Sharpe, D. K. Mulvany, P. G. Scott, H. G. E. Arthure, P. B. Moroney, K. J. Gilchrist, O. S. Tubbs, S. E. Birdsall, C. H. Gray, R. F. Winckworth, P. Baron, Doris B. Brown, R. V. Payne.

A diploma of Membership was granted to Dorothy Joan Thompson, and licences in dental surgery were granted to fifty-nine candidates.

Diplomas in Anaesthetics were granted jointly with the Royal College of Physicians to the following forty-six candidates:

H. K. Ashworth, J. H. Attwood, A. Barnsley, C. A. Borland, Lorna Bray, H. J. Brennan, R. J. B. Broad, A. I. P. Brown, F. F. Cartwright, T. H. Chadwick, D. J. Davies, Winifred Dean, H. G. Dodd, N. A. Gillespie, J. Gillies, A. P. Gorham, R. B. Gould, H. F. Griffiths, Gwendolen Harrison, G. Hochschild, Mary J. Hudson, R. Jarman, E. F. Johnson, Alison R. Kerridge, L. H. Lerman, A. Lucas, W. S. McConnell, Jean S. B. McNeil, S. V. Marshall, E. A. Marson, A. G. Miller, J. C. Nicholson, M. D. Nosworthy, E. A. E. Palmer, B. Rait-Smith, E. H. Rink, F. W. Roberts, K. MacD. Ross, Doris M. Sanders, J. D. Scott, E. V. Slaughter, C. E. Sykes, Sheina C. H. Watters, J. H. West, Rose E. Williams, F. C. Wright.

Medico-Legal

DERMATITIS FROM UNDERCLOTHES

Grant v. Australian Knitting Mills, Ltd., and Others

The Judicial Committee of the Privy Council recently delivered judgement in a claim for damages for dermatitis contracted as a result of wearing underpants. The appellant was a doctor practising in Adelaide, South Australia, and the respondents were the retailers of the pants, John Martin and Co., Ltd., and the manufacturers, Australian Knitting Mills, Ltd. The Chief Justice of South Australia, after a trial lasting twenty days, had given judgement for the doctor for £2,450 and costs. On appeal the High Court of Australia had set aside that judgement, and Dr. Grant had appealed again to the Privy Council.

Dr. Grant bought two pairs of underpants and two singlets from the retailers and donned one suit on June 28th, 1931. On that evening he felt itching in the ankles, and next day a redness appeared. He then changed his underwear and put on the other suit which he had purchased. His skin trouble got worse, but he did not associate it with the clothing. A dermatologist advised him to discard the garments, and he returned them to the retailers saying that they had given him dermatitis. The irritation became generalized and very acute, and he was in bed for seventeen weeks. After a holiday he resumed practice, but soon relapsed, and was in hospital for three months in the following year. At times the dermatologist in charge of the case feared that he might die.

Their Lordships considered the Australian courts' meticulous discussion of the medical evidence, and decided that the dermatitis was of external origin and not dermatitis herpetiformis, as the defendants contended. They further held that the appellant's skin was normal, as he had habitually worn woollen undergarments without inconvenience up to the material time. A skin test for wool sensitiveness had proved negative. The manufacturers had admitted that the garments contained sulphur dioxide, which indicated the presence of free sulphites. Sweat combined with the sulphites to form sulphur dioxide, sulphurous acid, and sulphuric acid; the last is an irritant producing dermatitis in a normal skin. An analytical chemist had reported the presence of 0.0201 per cent. of sulphur dioxide by weight in one pair of pants and smaller amounts in the other garments, but all the garments had been washed before being returned, and one scientist had expressed the opinion that the amounts must have been greater before washing. In one of the manufacturing processes a solution of bisulphite of soda is used and subsequently neutralized by bicarbonate of soda. Their Lordships felt that something might have gone wrong during this process, which would be somebody's fault, and concluded that the disease contracted and the damage suffered by the appellant were caused by the defective condition of the garment sold to him which the manufacturers had put forth for retail and indiscriminate sale. The retailers, they said, were liable under the Australian Sale of Goods Act, which contains the phrase that the goods shall be reasonably fit for the purpose for which they are sold and of merchantable quality, and that there shall be no defects which an examination will not reveal.

Their Lordships held that the appellant was substantially relying on the retailers to supply him with a correct article, and that they were not exempted from their duty under the Act because of their conversation with him about prices and different makes. He could not detect, and had no reason to suspect, the presence of sulphites. The garments were saleable in that anyone who did not know of the defect would readily buy them, but they were not merchantable in the statutory sense, because they had a defect which made them unfit to be worn next to the skin. The retailers were therefore liable to Dr. Grant for damages for breach of contract, because by the Sale of Goods Act there is an implied contract between the retailer and the purchaser.

There was, however, no contract between the manufacturer and purchaser, and Dr. Grant had no claim against the Australian Knitting Mills unless it could be shown that they had been negligent and had failed in some duty they owed

to him. Their Lordships inferred negligence from the existence of the defects, coupled with the evidence of the process of manufacture. There was a complicated legal argument attempting to maintain that the chain of cause and effect from the manufacturer's negligence to the purchaser's suffering was too long to be held intact by the law, but their Lordships referred to the case of Donoghue *v.* Stevenson (1932) and decided otherwise. In this case the manufacturers of some ginger-beer were held liable (by a majority of the House of Lords) for the suffering experienced by a lady who found a decomposed snail at the bottom of a bottle of it. The bottle was opaque, and she could not by reasonable examination have detected the snail before the bottle was emptied. The principle on which this case was decided was that, although there was no personal intercourse between the makers and the consumer, she was obliged to use the article exactly as it left the maker and no intermediate retailer could affect its condition. The thing was dangerous in fact, the danger was hidden, and the danger was due to want of care in manufacture. In such a case the manufacturer could be held liable to the consumer. Their Lordships felt that all these essential features were also to be found in the present case, and drew a precise comparison between the chemical in the pants and the snail in the opaque bottle. No distinction could be drawn, they said, between a noxious thing taken internally and a noxious thing applied externally. The garments were made to be worn next to the skin. The Privy Council therefore restored the original judgement of the Chief Justice of South Australia against both retailer and manufacturer and allowed the costs there and in the courts below.

Medical Notes in Parliament

[FROM OUR PARLIAMENTARY CORRESPONDENT]

The Government hoped that both Houses of Parliament would begin the Christmas Recess by December 20th. Debates on foreign affairs were held in both Houses during the week. The House of Commons made progress with the Unemployment Assistance (Temporary Provisions) Bill, the Railways (Agreement) Bill, and the Employment of Women and Young Persons Bill. The business of the Lords included the Expiring Laws Continuance Bill and the Hours of Employment (Conventions) Bill. The Parliamentary Medical Committee will hold its first meeting soon after the reassembly of Parliament. The Conservative Health and Housing Committee had an inaugural meeting at the House of Commons on December 11th, when Sir Francis Fremantle was elected chairman and Captain G. S. Elliston honorary secretary. In an opening address Sir Francis Fremantle spoke of the work done by the last Parliament for national health. The main object of Parliament, he said, was to encourage health along natural, self-respecting lines, and to use for that end the powers of the Government in a manner mainly regulative, only incidentally restrictive and financial. The work in the new Parliament for those interested in health and housing would be to encourage the drive against the slums, to get the Town and Country Planning Act at work during the present building activity, to support the midwives and maternity legislation, and to co-operate with the Conservative Education Committee on the improvement of school medical inspection and other problems. Other outstanding questions for discussion would be patent medicines, vaccination, birth control, the proposed socialization of the medical services, and the health of the Tropical Empire. Nutrition and factory legislation were also mentioned as subjects to which the Health and Housing Committee may turn.

Dr. Henry Morris-Jones has been appointed a Lord Commissioner of the Treasury, and has resumed his duties as a Government Whip.

The Bury and District Joint Hospital District Bill, the North-East Lindsey Joint Hospital District Bill, and the South Staffordshire Joint Small-pox Hospital District Bill were read a first time in the House of Commons on December 11th.

The Government of India (Reprinting) Bill, to divide the Government of India Act into two parts, has passed the House of Lords, and was read a first time by the House of Commons on December 11th.

Voluntary Hospitals Grants in Special Areas

In reply to Mr. S. Storey, on December 12th, Mr. ERNEST BROWN announced that the Commissioner for the special areas was now prepared to make grants to the governing bodies of voluntary hospitals in the special areas towards the cost of the provision of new or the extension or alteration of existing hospitals or out-patient departments on certain conditions. Mr. Storey asked Mr. Brown to convey to the Commissioner the thanks of the voluntary hospitals in special areas.

Maternal Mortality

Mr. RHYS DAVIES inquired, on December 12th, what steps the Minister of Health had taken, or proposed to take, apart from that of an inquiry, to encourage schemes with a view to reducing the high maternal mortality rates prevailing in certain areas of the country. Sir KINGSLEY WOOD reminded Mr. Davies that the Government had announced its intention to introduce a Bill for the provision by local authorities (in co-operation with voluntary associations) of a salaried service of midwives. As individual inquiries now being carried out in areas with high maternal mortality rates were completed, the attention of the local authorities was drawn to any improvements in maternity services which the investigations showed to be desirable. The response had so far been generally satisfactory. When all special investigations were completed, Sir Kingsley would make a further comprehensive review of the position. Other steps now being taken included the encouragement of an increased provision of ante-natal clinics and hospital beds for maternity cases.

Investigation into Gas-and-Air Analgesia

Sir KINGSLEY WOOD, on December 13th, told Sir Robert Tasker that he knew a method of giving relief to women in their confinements known as gas-and-air analgesia had been in use for two years in the Liverpool Maternity Hospital and the Wellhouse Hospital, Barnet, and that favourable results were claimed for it. An investigation of this and other methods was being carried out by the British College of Obstetricians and Gynaecologists, but no findings had yet been published. On present information he did not consider that he would be justified in taking any action to ensure the use of gas-and-air analgesia in hospitals under control of the public health authorities, but the use of gas-and-air analgesia was within the discretion of the responsible medical officers of each hospital.

Free Milk during School Holidays

Mr. SHAKESPEARE, replying to Mr. Tom Williams on December 16th, said that at December 31st, 1934, 398 of the 421 local authorities responsible for maternity and child welfare arrangements in England and Wales supplied milk (fresh or dried) free or at less than cost price in necessitous cases to children under 5 years of age. In addition, eleven local authorities supplied milk at cost price. In many cases arrangements for the supply of milk to children of these ages were also made by charitable organizations. Statistics were not available giving the total number of children supplied with milk under these arrangements. Mr. OLIVER STANLEY also told Mr. Tom Williams, on the same date, that arrangements were made in some districts for the distribution of cheap milk on non-school days. He had no information about the number of schools where this was done nor about the number of children who attended. In twenty-two areas arrangements were made by the local education authority for the provision of free milk during school holidays, and in a few cases also during week-ends in term time. Distribution of cheap milk was not a matter for the local authorities, but for individual schemes and schools.

Doctors and the Speed Limit

The Minister of Transport was asked a question, on December 16th, about recent cases in which doctors had been summoned for exceeding the speed limit when proceeding to patients dangerously ill or to persons who had met with serious accidents. Mr. DAY suggested that the Minister should issue regulations that would allow medical practitioners in those cases, providing some distinguishing sign was exhibited on the front of their cars, to exceed the speed limit when necessary. Captain HUDSON replied that the Minister of Transport had no power to make regulations on the subject, and agreed with the view expressed by the Home Secretary that the matter could best be left to the courts.

Purity of Vaccine Lymph

On December 16th Sir KINGSLEY WOOD gave an assurance that all practicable steps were taken to ensure the purity of vaccine lymph issued by the Government lymph establishment. He was advised that it was not yet possible to guarantee absolute absence of risk that encephalitis would follow the use of lymph, although the risk was very small. Answering Mr. Broad, on December 13th, Sir KINGSLEY WOOD said notices were posted in the medical press requesting medical practitioners to notify his Department of all cases of post-vaccinial encephalitis. Information was also obtained from the returns made by public vaccinators, and by the examination of all death certificates on which any reference was made to vaccination.

Precautions Against Air Attack.—Replying to Mr. Gardner and Mr. Acland on December 12th, Mr. GEOFFREY LLOYD (Under Secretary for Home Affairs) said the Air Raid Precautions Department was holding a series of conferences with local authorities throughout the country. Local authorities almost universally had shown their willingness to co-operate with the Government in the formulation of precautionary measures for the protection of the public against the effects of air attack. So far there had hardly been time for local authorities to complete detailed schemes for their areas; but a considerable number of schemes were already being discussed between the Department and the local authority concerned. The arrangements to be made for the provision of respirators had been under close examination for some time past. He hoped it would be possible to make a full statement on this subject in the near future.

Variola Major.—Mr. GROVES asked the Minister of Health to what influence his medical officials attributed the almost complete freedom from variola major which this country had enjoyed during the past thirty years, particularly in view of the fact that during the same period approximately only one-half the infants born had been vaccinated. Sir KINGSLEY WOOD replied, on December 12th, that complete knowledge of all the influences affecting the prevalence and spread of variola major was still lacking, but two important factors were: improvement in the supervision of contacts, and a more general appreciation by them of the value of vaccination as a protective measure.

A "Cancer Cure."—Mr. GARRO-JONES asked, on December 12th, for information concerning the treatment of malignant tumours as practised by Dr. Revelis and others in Paris hospitals; and whether the Ministry of Health was co-operating in the tests of this method now being conducted in London. Sir KINGSLEY WOOD said inquiries into whether there was a prima facie case for further investigation were proceeding. This treatment had been practised for too short a period to justify any conclusion as to its value. He did not know that any tests of the method were being conducted in London. [See *British Medical Journal*, December 14th, p. 1159.]

Notes in Brief

During the year ended March 31st, 1935, 16,389 applications for enlistment into the Royal Air Force were received. Of these, 7,085 were medically examined; 2,786 were found medically fit and 2,347 were attested.

The committee now considering legislation to consolidate the law relating to local government and public health will in due course take up the question of consolidating food legislation.

Medical News

Courses of instruction arranged by the Fellowship of Medicine will be given as follows: in dermatology, at St. John's Hospital every afternoon, from January 2nd to 30th; cardiology, at the National Hospital for Diseases of the Heart, January 13th to 24th (limited to twenty); urology, at St. Peter's Hospital, from January 20th to February 1st (limited to eight); proctology, at St. Mark's Hospital, February 3rd to 8th; neurology, at the West End Hospital, February 3rd to 8th; gynaecology, at the Chelsea Hospital for Women, February 10th to 22nd. Week-end courses for general practitioners will be given at the Royal Chest Hospital on January 18th and 19th, and at the St. John Clinic and Institute of Physical Medicine on February 8th and 9th. Further particulars may be had from the Fellowship of Medicine, 1, Wimpole Street, W.1.

The next annual meeting of the British Association for the Advancement of Science will be held at Blackpool from September 9th to 16th, 1936, under the presidency of Sir Josiah Stamp. The sectional presidents include: chemistry, Professor J. C. Philip; zoology, Mr. Julian Huxley; anthropology, Miss D. A. E. Garrod; physiology, Professor R. J. S. McDowall; and psychology, Mr. A. W. Wolters.

The King has granted Dr. Gordon Winstanley Spencer authority to wear the Insignia of the Fourth Class (Civil Division) of the Order of Al Rafidain conferred upon him by the King of Iraq in recognition of valuable services rendered by him as chief ophthalmic specialist in the Iraq Health Service.

The King has appointed Dr. Christopher James Wilson, *M.C.*, to be a Nominated Unofficial Member of the Legislative Council of the Colony of Kenya.

The issue of *Paris Médical* for November 30th is devoted to the inaugural address of Professor Paul Harvier, on "Good Sense in Therapeutics," delivered on his installation in the chair of therapeutics in the Paris Faculty of Medicine.

Dr. Simon Wigoder has been appointed chairman of the health, maternity, and child welfare committees of the Morley (Leeds) Town Council.

The Turkish Government has granted the Red Crescent (the equivalent of the Red Cross in Turkey) the monopoly of importing, preparing, manufacturing, and selling anti-malarial and anti-syphilitic remedies in Turkey. The law giving expression to this decision of the Grand National Assembly came into force on September 1st.

The German Society of the History of Medicine, Natural Sciences, and Technique has awarded Professor Wilhelm Haberling of Düsseldorf, joint editor of *Mitteilungen zur Geschichte der Medizin*, the Sudhoff Medal for his eminent services to the history of medicine.

The fall in maternal mortality in Italy from pregnancy, labour, and the puerperium is shown by the following figures. Out of 10,000 births the combined mortality from these causes was 31.3 in 1924, 27.3 in 1928, 26.6 in 1930, and 26.7 in 1934.

A memorial stone erected by the Germano-Japanese Club at Tokio was recently unveiled at Kusatsu in honour of the German physician Dr. Baelz, who lived in Japan during the last decade of the nineteenth century and was professor of medicine and the Emperor's medical adviser.

Professor Wolf Lorenz, the octogenarian orthopaedic surgeon of Vienna, has been honoured by having had a plaque affixed to his birthplace at Weidenau in the Sudetic Mountains.

The Rockefeller Foundation has awarded the University of Michigan 14,000 dollars for the application of spectroscopic methods to medicine.

The House of the British Medical Association, including the Library, will be closed for the Christmas holiday from 6 p.m. on Tuesday, December 24th, to 9 a.m. on Friday, December 27th (Library 10 a.m.).

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to **The EDITOR, British Medical Journal, B.M.A. House, Tavistock Square, W.C.1.**

ORIGINAL ARTICLES and LETTERS forwarded for publication are understood to be offered to the *British Medical Journal* alone, unless the contrary be stated. Correspondents who wish notice to be taken of their communications should authenticate them with their names, not necessarily for publication.

Authors desiring REPRINTS of their articles published in the *British Medical Journal* must communicate with the Financial Secretary and Business Manager, British Medical Association House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS. if reprints are required, as proofs are not sent abroad.

All communications with reference to ADVERTISEMENTS, as well as orders for copies of the *Journal*, should be addressed to the Financial Secretary and Business Manager.

The **TELEPHONE NUMBER** of the British Medical Association and the *British Medical Journal* is EUSTON 2111 (internal exchange, five lines).

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FINANCIAL SECRETARY AND BUSINESS MANAGER (Advertisements, etc.), *Articulate Westcent, London.*
MEDICAL SECRETARY, *Medisecra Westcent, London.*

The address of the Irish Office of the British Medical Association is 18, Kildare Street, Dublin (telegrams: *Bacillus, Dublin*; telephone: 62550 Dublin), and of the Scottish Office, 7, Drumsheugh Gardens, Edinburgh (telegrams: *Associate, Edinburgh*; telephone: 24361 Edinburgh).

QUERIES AND ANSWERS

Priapism after Pruritus Ani

"C. C. H." writes: I should be grateful for suggestions for treatment in a man who for three years has been suffering from hypersensitive penis with continuous erection, which has so got on his nerves that he is now a complete neurasthenic. It started with pruritus ani, which left him suddenly; then this trouble started. I tried all the usual sedatives and local anaesthetic ointments and creams. He has been circumcised. The only suggestion I can make is prostatectomy, but he is not keen to attempt this, unless there is a real prospect of relieving the condition. I might add that he is happily married; there are no marital difficulties, and sexual intercourse does not relieve the condition.

Capillary Patches on Cheek

"K. S." writes: A patient has developed a capillary patch on each cheek following the use of a cosmetic face "patter." The capillaries are too fine for treatment by electrolysis. Can anybody suggest a treatment for fading these patches? Are *x* rays likely to be effective?

Operation for Enlarged Prostate

Dr. FRAM GOTLA (London, S.W.) writes: Lately I have had some patients with enlarged prostates who have been strongly advised by Continental urologists to have a Steinach operation in preference to the usual ones done here. I think it would be of great interest to general practitioners in this country if they could obtain through your columns first-hand information, from our urologists, on the value of this operation.

Haematuria after Abdominal Strain

Dr. L. I. HARDY (Hull) writes in reply to Dr. M. Bradford (December 7th, p. 1138): I wish to mention a case which is very similar to the one he described. My patient was a window cleaner, and on the particular day on which the haematuria occurred he was engaged in cleaning the numerous sections of glass constituting the dome of a large building. This necessitated a considerable amount of stretching of his lumbar muscles. He suddenly felt a pain in his side (I forget which), and some time later that day passed blood on micturition. This was an isolated instance, and he was unable to furnish me with a specimen which contained blood as indicated by the guaiacum-ozonic ether test. A few days later he developed a very acute pyelitis, and ran a high temperature for about a week. This gradually subsided, and left him rather weak and aching on the affected side. He was granted compensation.

Blepharitis

Mr. E. TEMPLE SMITH (Sydney) writes: A correspondent, "M.B., Ch.B.," asks, in your issue of October 5th (p. 650), for suggestions for the treatment of blepharitis of twelve months' duration. I presume that it is of the squamous variety. This is due usually to the invasion of the hair follicles by the diplobacillus of Morax-Axenfeld. This can be cured, often in one sitting, always in two or three, by zinc ionization. About one milliampere should be applied with a zinc-sulphate soaked swab on the zinc electrode for several minutes. The electrode is pressed laterally and firmly on the lash-bearing lid margins till it blanches them; and ten minutes must be spent in going over the whole area in both lids. I usually follow this up with the use each night of an ointment of equal parts of ung. acid. borici and ung. hyd. ammon. In the pustular type of blepharitis, associated with recurrent styes and due to staphylococcal infection, ionization is not successful.

Income Tax

Maintenance of Indoor Assistant

"H. L." has been informed by the local inspector of taxes that the value of the board and lodging given is assessable on the assistant under Schedule E. He quotes as authority the case of Nicoll *v.* Austin.

*** In the case quoted the taxpayer had the right for ten years of occupying a mansion house free of charge, under the terms of agreements between himself and the company in which he had a controlling interest. There is a wide discrepancy between the facts of that case and the circumstances of an indoor medical assistant. So far as we are aware the authorities have not sought generally to apply the decision to cover such cases as this, and we suggest that in the event of the inspector maintaining his attitude "H. L." might put the facts in writing before the Secretary, Board of Inland Revenue, Somerset House, W.C.2. If he does so we shall be glad to learn the result, as the point is one of considerable importance to many members of the British Medical Association.

LETTERS, NOTES, ETC.

Thefts of Dangerous Drugs

At recent meetings of the National Committees of the National "Safety First" Association attention has been drawn to the frequent thefts of dangerous drugs from doctors' cars. This practice appears to be increasing, and may be attended with grave consequences. When it is not possible for motor cars to be left protected cases containing drugs should be removed. The co-operation of medical practitioners is asked for in preventing thefts of this kind.

A Memento of the World Tour

Some of the members of the British Medical Association who took part in the World Tour may be glad to know that Dr. Glinn has had an enlargement taken of the group which was photographed at Borobudur Temple, and copies may be had, at the price of 1s. each, from Kodak Limited, Kingsway, W.C.1.

Christmas Chocolates

Chocolate in block form has long been promoted in many homes from the list of luxuries to that of necessities, but chocolates in boxes have always retained a suggestion of luxury. This, despite the fact that chocolates in attractive boxes need no longer be expensive. The charm of chocolates is partly due to their increasing variety. Cadburys this year offer a whole gallery of boxes costing from forty shillings to sixpence in anticipation of the Christmas epidemic of present-giving.

Vacancies

Notifications of offices vacant in universities, medical colleges, and of vacant resident and other appointments at hospitals, will be found at pages 34, 35, 36, 37, and 40 of our advertisement columns, and advertisements as to partnerships, assistantships, and locumtenencies at pages 38 and 39.

A short summary of vacant posts notified in the advertisement columns appears in the *Supplement* at page 280.